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ABSTRACT

This document reports the findings of a 3-year study of company strategies and the training impact of labor organization in Germany. Among the topics discussed in the theoretical overview presented in section 1 are the following: the growing importance of learning in a working environment; Germany's continuing training "system" and funding structures; acquisition of skills in a working environment; structures explaining the process of acquisition of job skills in firms; regional training and continuing training structures; national variables explaining the development of training and continuing training structures; and the context for analysis of learning processes at the workplace. Section 2 consists of three case studies that were selected as being illustrative of the following: use of work-related skilling processes to update the skilling capacity of vocational training; use of group work as a form of work organization as part of continuing training at the workplace; and use of a newly introduced office communications system as a means of skilling at the workplace. Part 3 is a synthesis report that examines the case study findings regarding learning processes at the workplace and basic conditions and factors influencing learning at the workplace. The bibliography contains 13 references. (MN)

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CEDEFOP Document

The role of the company in generating skills:

the learning effects of work organisation

Germany

European Centre for the Development of Vocational Training

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The role of the company in generating skills — The learning effects of work organisation — Germany

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INTRODUCTION

The following report consists of three parts of the German contribution to the CEDEFOP research project examining company strategies and the training impact of labour organization. The project ran for three years and was divided into three stages.

Against the backdrop of a theoretical and methodical concept a macro-report was formulated (Part 1), describing the structural conditions in Germany for corporate action. The macro-report elucidates both the basic hypotheses and the selection criteria for choosing case studies.

In the case studies (part 2), carried out on the basis of a guide, the following were examined:

- the use of work-related skilling processes to update the skilling capacity of vocational training (enterprise A),
- the use of group work as a form of work organization as part of continuing training at the workplace (enterprise H),
- the use of a newly introduced office communications system as a means of skilling at the workplace (enterprise K).

The case studies were completed in 1992.

The summary report (part 3) examines again the central hypotheses in the macro-report, compares these with the case study findings and draws initial conclusions for learning at the workplace. In addition, it describes trends in company continuing training strategies and forms of work organization which promote skilling.

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SECTION ONE

TRAINING

1. THE GROWING IMPORTANCE OF LEARNING IN A WORKING ENVIRONMENT

The CEDEFOP framework paper for this project, the aim of which is to examine in-company learning processes beyond the field of formal in-company continuing training, is based on a central hypothesis, i.e. "the assumption that new forms of labour organization which stand in contrast to the characteristics of Taylorism which - as illustrated by the results of research in various Community Member States - are gaining considerable momentum, are on the one hand triggering an increased demand for skills and competences which can in part only be acquired in the framework of work experience and, on the other, the changed patterns of labour organization are generating new opportunities for the acqusition of skills in the working process."[2]

The purpose of the German study is to describe the different correlations suggested in this hypothesis between labour organization and the acquisition of skills in a work setting/at the workplace. The methodological purpose of the German contribution is therefore not to examine from a representative angle the extent to which these changing trends in labour organization can be expected to leave their mark on the working world of the future, or whether this is a development which may be substantiated in individual cases, but is nevertheless basically secular in nature. The case studies to be conducted in the framework of this project are to highlight the qualitative aspects of the fundamental hypothesis. Analysis is to be conducted of cases relating to company changes at the level of departments or work teams in which skill needs have been fundamentally redefined and in which new means of imparting skills have been sought, taking account of learning opportunities at the workplace.

Moreover, the very hypothesis underlying the project is also debatable: the results of research indicate that the clear correlation suggested by this hypothesis between the technical and organizational restructuring of production or service processes and the resulting increased and broader skill needs is not quite correct and must be adjusted in the light of the project results.

On the one hand, any technical and organizational change leads to a sertain degree of skills obselence. Depending on the type of change, this de-skilling may relate to routine skills. However, it is also possible that individual skill potential formed over many years of work experience may be seriously impaired, without any compensation as an offshoot of the process of change.

The second aspect relates to the designability of skill needs as a result of technical change. It is by no means the case that the skill needs of the workers in question and the necessary and possible job-related skilling potential at the workplace automatically follow on from the specific type of change. In-company decision-makers and the workers involved in fact have a considerable scope in the perception of and reaction to changing skill needs. Analysis of the potential scope, decisions and the respective framework conditions which determined the technical solutions chosen for labour and learning organization constitute a key aspect of this research project.

A further consideration stems from the central working hypothesis mentioned at the beginning of this chapter. Examination of the extent to which possible changes in in-company labour organization have led to a process of rethinking at the interface between the determination of skill needs and the determination of in-company continuing training schemes would seem to constitute a promising approach. In concrete terms, the question is: has in-company continuing training become decentralized to a relevant extent and can such trends be substantiated by changes in labour organization?

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2 Mehaut, P.: "Formale" berufliche Weiterbildung und Ausbildungseffekte der Arbeitsortganisation in deutschen Unternehmen. CEDEFOP, 1991, unpublished manuscript, p. 4.

If we follow the initial hypothesis, the result of the company case studies should be evidence that the determination of skill needs and the organization of training processes in the framework of in-company continuing training have come closer together in terms of both space and time. Only thus could the necessary flexibility in the framework of adjustments to new working structures be guaranteed.

A final reflection against the background of the initial hypothesis refers to a question which is more of a pedagogical nature, i.e. the integration of learning at the workplace into methodological considerations on the structure of in-company continuing training as a principle.

Although learning on the job has a tradition in initial training and has characterized the training of the majority of an age class over the last three decades in Germany, very few results of research have been presented in this field on the concrete shaping of this form of learning[3]. The efficacy of learning on the job has evidently not been a subject of research for the training world, but has rather been regarded as an expression of the freedom of training companies to design their training schemes themselves, without being unduly restricted by recommendations on the part of educationalists in doing so.

Continuing vocational training refers to that field of continuing vocational training characterized by systematic learning processes in all its individual segments. In particular in in-company continuing training, Tayloristic labour structures provided one of the motives for these processes. "Labour, largely moulded by Taylorism, was scarcely attributed activating learning potential; it was rather perceived as a de-skilling element and as a result the workplace was deprived of its significance as a place of learning."[4]

More recently, learning at the workplace has been rediscovered in the framework of in-company continuing training. Various interdependent trends formed the background to this rediscovery:

- Both in the industrial/technical and commercial fields, the use of new technologies permits forms of labour organization catering for the profile of an independent worker assuming his own responsibility, thus readmitting learning in a working setting.

- Faced with increasing international competition, the firms are forced to improve the cost-benefit ratio of in-company training schemes. Training schemes close to the workplace provide appropriate solutions in this context.

- Workers themselves will be more inclined to build their skills if learning opportunities are closely related to their respective activities and can be directly implemented with relevance to their jobs.

The report commissioned by the Federal Ministry of Education and Science mentions the close interaction between new forms of labour organization and in-company continuing training close to the workplace as an important field for continuing training research:

"Scientific research is required to [...] examine whether the presumed effects of the expansion of learning opportunities in the working process also permit or even call for opportunities for action,

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3 Franke, G.: Lernen am Arbeitsplatz, Berlin, 1988

4 The Federal Minister for Education and Science (ed.): Betriebliche Bildung Weiterbildung - Forschungsstand und Forschunsperspektiven. Bonn, 1990, p. 418.

design and participation, i.e. whether the increase in the scope of the individual structuring of the learning process also develops potentials at the level of the structuring of the personal working situation."[5]

2. THE FRAMEWORK CONDITIONS OF IN-COMPANY CONTINUING TRAINING IN GERMANY - THE CONTINUING TRAINING "SYSTEM" AND FUNDING STRUCTURES

The role of in-company continuing training in the national context as a whole has an essential impact on the relations between learning and work which are the subject of this study. Since comprehensive national studies have been commissioned by CEDEFOP on the structure and funding of continuing vocational training in the individual Member States, we shall merely summarize a number of key indicators at this point to provide the reader with a better understanding of German continuing training structures. These key indicators concern the following
fields:

- the sub-segments of continuing vocational training structures, their significance, links between the sub-segments, relations between the initial vocational training system and continuing training structures
- the funding of continuing vocational training and legal provisions in this field and
- the definition of the role of the state in the field of continuing vocational training.

2.1 Continuing vocational training sub-segments

Continuing vocational in Germany is an extremely comprehensive field. The simplified structural model hereunder gives a general overview.

Diagram showing the sub-segments of continuing vocational training and overlapping areas

Source : E. Sauter, 1989, p. 5

[5] ibid, p. 421

The diagram shows the most important sub-areas:

- continuing training promoted by the federal manpower services (Bundesanstalt für Arbeit) on the basis of the Law on the Promotion of Labour, essentially determined by the demand for training schemes from the job centres and primarily catering for the jobless or those threatened by unemployment

- individual continuing training in which individuals seek training provision, regardless of institutional dependencies

- in-company continuing training, either when the firms serve as the deliverers of continuing training for their employees or when they seek continuing training provision in cases in which they have no or insufficient continuing training infrastructures of their own.

The problem with quantitative and structural analysis is that there are considerable overlaps in continuing training sub-areas which moreover cannot be clearly delimited.

For example, firms may implement schemes sponsored by the federal manpower services, but may also participate in individual training schemes by offering their employees work release or granting subsidies; similarly, the Bundesanstalt für Arbeit also participates in individual continuing training, e.g. classical upgrading training measures, e.g. by the provision of subsidies.

A regular survey among the overall working population of Germany shows that in 1991 the firms were the main continuing training deliverers (44% of participation). The firms are only slowly gaining importance as providers of schemes within the sub-group of the training courses sponsored by the Bundesanstalt für Arbeit (1975 = 12%, 1987 = 14%, 1990 = 15%). In the old Federal States the numbers have decreased since 1991 (=11.4%; 1992 = 8.6%)[6]

In the field of in-company continuing training, there are considerable differences in continuing training activity according to the size of the firms in question: one fifth of all participants come from large-scale enterprises (with a workforce of 2 000 +).[7]

There are also considerable differences between individual industrial sectors: the electrical engineering and metalworking sectors show above-average participation in continuing training schemes, whereas the chemical, engineering and textile sectors tend to be under-represented.[8]

2.2 Relationship with initial vocational training

Continuing vocational training cannot be appropriately interpreted without being placed in the context of the participants' previous educational and vocational experience. In the German context, this means consideration of the quantitative and qualitative significance of in-company vocational training.

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[6] The Federal Ministry for Education and Science (ed.): Berichtssystem Weiterbildung. Bonn 1991, p. 120; Bundesanstalt für Arbeit (ed.): Förderung der beruflichen Weiterbildung. Nuremberg (annually).

[7] ibid., p. 127

[8] ibid.

Following general education, transition into the in-comp any vocational training system is the rule for the majority of German youngsters (approx. 70% of an age class).[9]
The term "dual system" is used to describe the German type of vocational training in which the practical side of training takes place in the training firm under the supervision of a trainer, while the theoretical side is generally imparted by a state vocational school, attended by the trainee for one or two days a week.

The training course is regulated by a training contract between the trainee and the training company. Training may be imparted in one of the 376 officially recognized training occupations,[10] each governed by training regulations stipulating the minimum quality requirements. This permits statements on the knowledge and competences to be expected of a skilled worker who has received training in his particular occupation. Completion of training in a training occupation therefore has an important orientation function for the employment system. The training regulations are issued by the federal government (the competent specialized minister in conjunction with the Federal Minister for Education and Science). The social partners, the federal ministers concerned and the Bundesinstitut für Berufsbildung (Federal Institute for Vocational Training) are involved in the training regulation elaboration procedures; initiatives for amendments to training regulations generally stem from the social partners.

Two aspects of the dual training system are of particular importance for analysis in the field of continuing vocational training:

◊ From the structural point of view, it is significant that such a large percentage of precisely younger workers have a qualification at skilled worker/journeyman level. This means that remedial continuing vocational training measures - either related to deficits in the technical field or workplace-related socialization - have much less weight in Germany than in countries in which relevant parts of an age class seek labour market access following school-based vocational education or with no initial vocational training.

◊ Alongside the structural aspect, a pedagogical aspect is also significant. Informal learning processes, drawing on the specific learning opportunities on the job, are the focus of this project. It is to be assumed that such learning processes will be different, and perhaps more efficient, in the case of those leaving an initial training system in which precisely learning on the job plays a central role - as is the case in the German dual system - to those of workers whose previous vocational preparation has been merely school-based. This is a hypothesis for examination in the framework of the case studies.

2.3 Funding of continuing vocational training

An important hypothesis in CEDEFOP's projects in the field of continuing vocational training is that funding structures constitute an essential structural characteristic of the content and organization of continuing vocational training, an assumption which has yet to be refuted by the results of international comparative research.

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9 Bergner, S., et. al.: Couintry studies on the financing of vocational trianing with particular reference to continuing training for the gainfully employed, CEDEFOP document, Luxembourg, 1991, p. 4

10 Bundesinstiut für Berufsbildung (ed.): Die anerkannten Ausbildungsberufe. 1992 edition, Bielefeld, p. 11

It has nevertheless become evident that the content and target groups of continuing training schemes must be given more attention than hitherto and that it is necessary to supplement the analysis of systematic training schemes both inside and outside the firm by the learning on the job spectrum. The often extremely complex funding structures nevertheless remain one of the central framework conditions for the design of in-company continuing training.

As already mentioned, the three main sub-areas of continuing vocational training constitute the three main financiers in this field. The financial input of the three financiers and their relative share of the overall volume of funding are disputed. The Institut der deutschen Wirtschaft (Institute of German Industry) estimates the financial contribution of the firms at DM 26.7 billion in 1987[11], a figure which is above all contested by the workers' side.

Public authorities (central government, the Länder and local authorities) spent DM 3.8 billion on continuing vocational training in 1992. In addition, DM 19 billion were provided by the federal manpower services from unemployment insurance contributions, funded 50-50 from the compulsory contributions of employees and their employers.[12]

No statistical data are available on the levels of expenditure on individually funded continuing vocational training.

On the basis of the available data, CEDEFOP estimates for 1991 that the financial ratios between the three main financiers are 53.5% from the firms, 21.9% from the federal manpower services, 19% from public authorities and 5.6% from individuals.[13]

With reference to these estimates, it should be reemphasized that the "normal" type of funding in the case of continuing vocational training is a mixed form. No estimates are currently available on the volume of indirect cofunding of individual continuing training schemes via wage and income tax allowances. It is merely evident that those in higher income brackets draw more benefit from these public subsidies than those in lower wage brackets; moreover, the unemployed, who pay no taxes, draw no benefit from these measures whatsoever.

For the individual financiers of continuing vocational training, mixed funding is a flexible opportunity of involving other financiers in the costs of self-initiated continuing training, although at the price of being obliged to give due consideration to the financial criteria/motives of these other financial sponsors. This also applies to the field of in-company continuing training.

2.4 The role of the state in continuing vocational training

The basic assumption of the German legislator is that the parties to the collective agreement in question are responsible for the shaping of the skilling of their workers. The Labour-Management Relations Act (Betriebsverfassungsgesetz) spells out basic procedural principles designed to

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11 Weiss, R.: Die 26-Mrd.-Investition - Kosten und Strukturen betrieblicher Weiterbildung. Cologne, 1990, p. 189.

12 The Federal Minister for Education and Science (ed.): Grund- und Strukturdaten 1992/93. Bonn, November 1992, p. 300.

13 Alt, CH./Sauter, E./Tillmann, H.: Bericht über den gegenwärtigen Stand der beruflichen Weiterbildung in der Bundesrepublik Deutschland (Bericht nach Art. 11 des FORCE-Aktionsprogramms). Photocopied manuscript. Bundesinstitut für Berufsbildung, Berlin and Bonn 1993, pp. 46ff.

enable both sides of industry to reach agreement on a joint further training programme at company level.

Insofar as social welfare entitlements on the workers' side are related to the completion of further training, these qualifications and the relevant certificates are governed by statutory or public law regulations. However, such measures account for only a small proportion of overall continuing vocational training provision, especially in the sub-area of in-company continuing training.

Since state intervention is limited to a mere handful of regulations of detail and the provision of general framework conditions, certain continuing vocational training sub-areas can be described as a "regulated market":

- Continuing training courses involving a minimum of 200 hours of learning may be regulated by means of certificates leading to entitlements or better job prospects in the employment system; however, most in-company training courses are much shorter than this.

- Since workers tend to opt for "regulated", rather than non-regulated continuing training schemes because of the job market opportunities involved, and employers prefer to recruit those leaving such courses, continuing training bodies also implement such courses, thus indirectly subjecting themselves to public control.

"Regulated" schemes are a minority in the field of in-company continuing training; the state prefers not to intervene in the dominant field of updating training. It is assumed that the pressure of competition between the firms in this field means that continuing vocational training is perceived by industry as an investment in human capital and is offered to the workers under close to the market conditions with the participation of the representatives of the company workforce, regulated by collective agreement as appropriate. State continuing training policy is subsidiary and merely oriented towards the provision of financial incentives and remedial measures in cases of impending unemployment.

3. THE ACQUISITION OF JOB SKILLS IN A WORKING ENVIRONMENT

The central point of reference of the present study is analysis of the conditions of learning on the job. Before attempting to describe the welter of influential variables in the national context and to present working hypotheses for the planned case studies in the following chapter, let us first of all outline the direct field of our investigation - which presumably lies above the dimension of the individual job, but below the organizational unit of a company department - on the basis of dichotomic descriptive and structural categories.

The five category levels chosen are as follows:

- Innovation versus constancy
- Attribution of tasks versus flexibility
- Horizontilization versus verticalization
- Networking versus stand-alone solutions
- Participation versus positional determination.

3.1 Innovation versus constancy

With the advance of automation generated by information and communications technology, technical/productive and clerical/administrative processes are "disappearing" behind the VDU and

process connections are implemented by information technology. The consequence of this development is the reduction, or even elimination, of hitherto time-intensive operative activities, e.g. control of machine tools or the calculation of tables, and coordination activities between working stations. This means that work is transformed into automation work[14], essential parts of which involve information work. Task-oriented design, problem solution-related user programming, the establishment and adaptation of automated processes and fault finding, elimination and prevention, task-related data capture, etc. - differing in content and profile in the specific technical/productive and clerical/administrative processes - become central work tasks.

This radical change in work tasks can be characterized at the level of working actions as the transition from the implementation of closed actions, which can be learned in the framework of closed curricula in initial training or organized continuing training and kept "in reserve", to open actions whose component characteristics and sequence cannot be unequivocally redetermined and learned "in reserve".

For this reason - and this is no longer a subject of dispute - theoretically substantiated knowledge and skills are increasing in demand for purposes of adequate management of work tasks in the context of automated processes. These competences are not only related to new technologies, but concern in particular specialized occupational content, working methods and cooperation. On top of this, software-based flexible automation is triggering a previously unknown degree of product and market flexibility. Product flexibility and process innovation not only increase demands at the workplace, but also make these demands a matter of permanent interest to the workforce. To give an example, when refinery values are measured in process optimization, it is important to ensure that the resulting destilled products reach different prices according to the market situation.

In the course of the last three decades, the reaction to the development of skill needs was first of all the growing systematization of vocational and continuing training. The workplace was not regarded as a learning resource suitable for imparting the theoretical bases necessary in the modern working context. The growing demands were catered for by increasing proportions of formal training phases in the workshop or the classroom. The demands on school leaving certificates as a condition for admission to vocational training courses increased.

As initial and continuing training became increasingly academic and unrelated to actual practice at the workplace, it also became increasingly far-removed from direct practical experience. However, ongoing direct practical experience is absolutely necessary if trainees are to draw benefit from the theoretical bases imparted in the classroom in the practical world of automation. Automation practice, e.g. fault finding, prevention and elimination in technical and productive processes, shows that it is impossible to force practice into a theoretical straitjacket.

The changes in working processes are now increasingly undermining the trend towards the academization of vocational training, based on educational requirements. The question of a new relationship between the shift and integration of learning into the world of work is therefore now emerging.

Working practice is not merely a matter of faults - there is as yet no established theory for many phenomena to be found in practice. To cope with these phenomena, e.g. in technical and productive processes, it is often only possible to evaluate common experience, to systematically acquire experience in the context of cooperative experiments or to implement attentive, joint control and follow-up assessment of interventions related to the overall process. Automation

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[14] cf. Projektgruppe Automation und Qualifikation: Wiedersprüche der Automationsarbeit. Ein Handbuch. Berlin, 1987.

practice shows that the world of practice must become the subject of theory in order to permit adequate process intervention, control, steering and design. This can only be achieved in the framework of cooperation, whereby personal responsibility must also be assumed.

The two requirements of automation work - direct utilization of theoretically substantiated, action-oriented competences in practice and the analytical penetration of direct practice, i.e. temporal and spatial integration of both requirements - must be embedded in either extensions to or expansions of existing theories or new theories. Automation work calls for and permits the "informalization" of learning processes. These requirements can be accommodated by organizing a training infrastructure directly on the job, in the proximity of the workplace and/or in freely accessible learning centres. This training infrastructure may be entirely different at the respective places of learning and it is the task of the project to examine this field.

Automation work gives rise to new contradictions in skills:

- ◊ To provide workers with the competence to act vis-à-vis the theory implemented in the technical installations, they must penetrate more deeply into scientific theories in the learning process and perhaps make a contribution of their own to the further theoretization of the processes; at the same time they must relate their theoretically oriented learning directly to the practical problem to be solved.

- ◊ In the context of the learning process, workers must be aware of the logic and functionality of process-related interactions as a prerequisite for target-oriented action; at the same time they must relate to the analytical reconstruction of the functionalities of practical details - without excessive regard to detail.

- ◊ Given the new requirements, workers must dovetail their learning more specifically towards individual learning needs which may be extremely heterogeneous in view of the growing differentiation of skill needs and individual learning prerequisites; at the same time they can best develop their individual learning in the framework of cooperative learning processes - because many problems must be spontaneously solved in the framework of cooperative situations, directly established by the workers themselves.

It is becoming evident that in the field of skilling for working tasks, it can no longer be a question of determining and compensating for deficits, i.e. the acquisition of sedimented qualifications. It is rather a question of developing a learning potential which must essentially emerge by means of the workers' capacity for self-management and self-organization, i.e. the acquisition of innovative skills. This gives rise to new demands on the vocational training system as a whole, on managers and on in-company work and learning culture, which may be characterized as the provision of support mechanisms for workers' capacity of self-management and self-organization.

3.2 **Attribution of tasks versus flexibility**

The rationalization of productive and administrative processes with the aid of new technologies has led to a technical combination of the numerous individual processes on two fronts:

- ◊ the combination of material and energy flows and
- ◊ the combination of information flows.

Prior to automation, both combination levels were assumed by groups of workers with extremely different skills. Apart from various remnants, all the actions and skills related to these combinations are now disappearing in these forms.

The workers therefore act almost "alongside" the processes which they establish, shape, control and maintain with comprehensive competences of intervention. Wide-ranging requirements are therefore demanded in terms of thinking and action in that each worker himself must relate his thinking and action to the overall process - even if he is only responsible for a small step in that process. Because the technical, and in particular the information technology combination of the individual processes means that decisions and intervention in one stage of a process may have serious consequences for the process as a whole - and perhaps devastating effects on the environment (as illustrated, among others, by incidents in nuclear power stations). As long as the combinations were established by the workers themselves, they simultaneously acted as potential "filters" for faulty information and material.

To a degree to be determined on a case by case basis, combined processes require knowledge of the aims, constructions and functionalities of the process as a whole, as well as its individual parts, even in cases in which the individual worker or groups of workers are only responsible for a delimited area of tasks. Tasks and responsibilities generally remain attributed to certain persons, even in the case of automated processes. This however by no means rules out the possibility of the design and delimitation of the tasks and responsibilities being subject to considerable change or being expanded, e.g. by the integration of tasks.

The question is: how can it be ensured, despite the attribution of tasks, that workers will appropriately take into consideration all the relevant aspects of the overall process at every second of their action? This is a learning problem which is hard to solve. It is difficult to find a solution to this problem since although participation in one or several systematic continuing training courses is a precondition, it is by no means adequate. Management of the dynamism of processes induces or compels the individual to recognize his current learning needs and to formulate substantiations of its scientific aspects. At the same time, the dynamism of the processes also calls for a direct relationship between the learning efforts and the practical requirements of the process.

This learning problem cannot be solved by the frequent and often undifferentiated debate on the integration of tasks. The integration of tasks stems from the amalgamation of usually different tasks, hitherto attributed to different persons. This amalgamation of tasks is rendered possible by the existence of a new technical and organizational level, e.g. the use of a PC in the office permits the integration of essential parts of typing work into a clerk's activities so that the corresponding process can be shaped in a much more efficient way. Cases in which the consecutive processing of different tasks is achieved by purely organizational changes are not examples of integration of tasks, but of flexibility in the assumption and attribution of tasks.

The integration of tasks generally renders the tasks performed by the individual more complex. It therefore contains more complex learning potential, often situated at completely different skill levels. Integrated tasks are characterized in that the amalgamated task components can generally no longer be divided among different persons without a considerable loss of efficiency.

In the case of more comprehensive combined processes, the integration of tasks does not offer a solution to the learning problem posed. Flexibility in the attribution and assumption of tasks, on the other hand, offers a useful solution which has been tested in industrial practice. This flexibility can be characterized as a temporal sequence of changing attributions of tasks. Two forms of flexibility will probably be encountered in the firms, consciously organized as learning processes integrated into the working activities of the companies or acting as such:

- the sytematically organized alternation between different tasks, e.g. alternation between work at a measuring station and maintenance and repair of the installation

- ◊ the systematically organized alternation between workplaces at different functional locations of an overall process, e.g. alternation between the manufacturer of parts and final assembly

- ◊ the alternation between different tasks according to the technical requirements of the moment, e.g. alternation between fault finding/elimination and process cycle protocolling.

Apart from the acquisition of knowledge and attitudes with respect to the overall process for the emergence of task-specific competence to act, flexibility in the assumption of tasks has above all the aim and effect of reinforcing the competence for task-related direct communication and cooperation. Direct communication and cooperation are necessary, particularly in the case of complex combined processes such as automated processes, and especially for learning processes at work.

A difficulty in implementing the flexible attribution of tasks for learning purposes lies in company organization and the support of flexibility. Traditional forms of labour organization, generally characterized by Taylorism, and centrally organized continuing training provision stand counter to this. - Whether or not there are differences to be observed according to company size and sectors is a question requiring empirical clarification.

A further difficulty is the increased identification of the workers with their respective attribution of tasks. The attribution of tasks gives workers an existential security since it eliminates competition to a certain degree and makes it more difficult for workers to be substituted. With each alternation in the attribution of tasks which offers, or may offer, new learning opportunities, the workers become vulnerable if they are no longer relieved from competition and no longer difficult to replace. It is up to the company case studies to examine the actual actions and attitudes of the workers towards flexibility.

3.3 Horizontilization versus verticalization

This category covers the trends in the change in labour organization underlying the central CEDEFOP hypothesis quoted at the beginning of this study.

Both social partners assume that changes in labour organization are triggered by the use of new technologies. However, whereas the assumption of the employers' position in the expert opinion drawn up for the federal ministry is that development towards a change in the predominant form of in-company labour organization is virtually inevitable, the workers' side stresses the freedom offered by new technologies when it comes to shaping labour organization, representing an option for in-company decision-makers and employees, but which can nevertheless lead to an intensification of vertical structures if not utilized.

(Employers' position):
"Companies which are highly dependent on the creativity and innovative capacity of their personnel need a special form of corporate culture and organization to be successful. The classical functional and hierarchical organization which has proved its worth in managing routine processes is no longer adequate for modern an entrepreneurial orientation. The increased use of information, communication, control and automation technologies in many economic sectors shall lead to the development of the principle of the division of labour towards holistic activity with a relatively high degree of autonomy of qualified and trained skilled workers."[15]

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[15] Federal Ministry for Eduction and Science (ed.): Betriebliche Weiterbildung ... op. cit. p. 18

(Workers' position):
"Examples of innovative concepts of in-company continuing training are above all to be found in cases in which in-company innovation strategies are no longer geared towards ad hoc measures implemented in the short-term, but increasingly follow an approach which perceives the development of the company from a long-term perspective and a cross-functional and inter-departmental point of view."[16]

The following four common denominators can be found in all the examples of a form of labour organization designed towards horizontilization indicated in the literature:

◊ The introduction of new technologies leads to a fundamental restructuring of labour organization, both in the field of production and process technologies and in the services sector. However the technological change did not necessarily lead to a specific form of labour organization in any of the cases described. In cases in which changes occurred in labour organization in a usually longer-term process of change, the restructuring was not clearly determined, but was the result of a longer process of negotiation among the parties involved.

◊ In cases in which the concepts of change contain elements of horizontilization, the skill needs of the employees concerned were fundamentally affected. Requirement elements shifted towards increased use of skill potential, in particular in the interdisciplinary field. The basis for such changes were thereby corporate strategies aimed at the introduction of new production concepts.

"The formula of the 'new production concept' stipulates that in companies of industrial core sectors the old basic Tayloristic concept of rationalization is also called into question from the management perspective and must be substituted by a new perspective. Whereas the old concept regarded the living world of work as an obstacle to production, to be overcome by extensive technical automation of the production process or controlled in its remnants by a restrictive form of labour organization, the new production concept recognizes the skilling and technical sovereignty of the workers as a decisive productive force which should be used more intensively: rationalization by using, as opposed to largely dispensing with skill potentials."[17]

◊ Closely related to the description of the finding of new labour structures geared towards the technical sovereignty of the workforce is the indication that in-company continuing training measures were intensified and the integration of learning forms in the working environment pushed through.

This is evidently connected to the reduced determination of the concrete working area, linked to the move away from Taylorism and the renewed increase of learning opportunities, and presumably also learning necessities, in the working process as a result of more complex working action.

◊ Whereas the combination of in-company technical innovations, new forms of labour organization, increasing skill needs and better learning opportunities can be observed as a relevant development at least in parts of industry below the workshop or departmental

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16 ibid., p. 329.

17 Kern, H. and Schumann, M.: Das Ende der Arbeitsteilung? Munich, 1984.

level, there is no unanimous appraisal of the fourth element to be considered in this context, i.e. the participative integration of the workforce in the described processes of change in labour organization. It seems obvious to involve the workforce as partners since the transformation of parts of work processes which can be made routine and individual working patterns into efficient software solutions needs the participation of the workers. The extent to which the worker approaches the profile of a "all-around learning, cooperative, competent, self-responsible and team-oriented member of the staff working on the basis of partnership" in the framework of new production concepts is a question to be examined in the case studies.

3.4 Networking versus stand-alone solutions

In the field of in-company continuing training, central organization of the determination of skill needs and the concrete design of training measures still remains the rule. Moreover, in most firms in-company continuing training is a reaction to short- or medium-term skill shortages. There is no integrated concept of corporate development, personnel development and in-company continuing training. In the light of the expansion of new forms of labour organization, two concepts can be envisaged for the organization of production and services, the application of which entails different consequences for the organizational design of in-company continuing training:

- a production structure which attempts to leave the flexibility of the working action of the employees centrally controlled by means of intensive networking and installation of management information systems,

- or the promotion of stand-alone solutions and other relatively autonomous structures with no fixed attribution of tasks and hierarchical levels.

If the decision on labour organization tends towards the second alternative, a preliminary decision for in-company continuing training follows on in close connection, in which forms of learning close to the workplace structured by the respective specific working situation and the problems to be solved in this context constitute an integral part.

3.5 Participation versus positional determination

This aspect is linked to the two preceding dimensions. Dispensing with verticalization and accepting relative autonomy cannot be achieved in the long term by merely stepping up the efficiency of new complex organizational structures or even as a new form of a human relations policy. New production concepts must rather be supported by a perception on the part of the worker that participation does not represent a compromise in the dispute between both sides of industry on in-company power or tactical personnel management strategies, but constitutes an expression of the insight that the expected creativity and readiness to cooperate and the motivation to seek solutions in a responsible manner in complex problem situations can only be expected on the basis of a relationship characterized by partnership.

At the same time this means that the training processes necessary for the solution of new problems stemming from technical and organizational change must be defined in the framework of the working process. At least part of in-company planning of training needs, "classical updating training" to keep abreast of technical change, could be largely decentralized and thereby made more flexible. If such a stategy were followed, the task of continuing training departments could simply be to provide the infrastructure for decentralized forms of teaching close to the workplace and to offer didactic assistance. In-company decision-makers would have to create the framework conditions in the departments and workshops to facilitate as smooth a transition as possible between the working and the learning situation in a familiar working environment - learning on the

basis of current problems.

4. STRUCTURES EXPLAINING THE PROCESS OF THE ACQUISITION OF JOB SKILLS IN THE FIRM

4.1 Overall company hierarchical structures

In-company hierarchical structures are a relevant factor in the design of in-company continuing training from two angles. The vertical structure of labour organization is defined by hierarchical levels. Vertical distribution of competences may represent a straitjacket, constituting a barrier to flexible adaptations in job configurations in the framework of technical and organizational change. Case studies are available in the commercial field which have shown that the introduction of networked information technology solutions adapted to existing vertical and horizontal configurations of groups of workers in the final analysis failed because of this adaptation.

In-company hierarchies, however, do not only influence labour organization, but are also responsible, or at least co-responsible, for the contents, the organizational structure, as appropriate, and above all, the concrete selection of participants in in-company continuing training measures. Moreover, company managers are the priviliged target group for participation in continuing training courses, especially in companies in which in-company continuing training is above all perceived as an instrument of leadership and domination skills.

A survey conducted by the Institut der Deutschen Wirtschaft on in-company continuing training in 1987[18] placed "management training and management techniques" with a rating of 42% in 9th position as far as the main content of in-company continuing training measures was concerned; courses on personnel management were in 5th position (45%). With reference to the main subject areas to be expected for the future, emphasis on imparting management skills becomes even clearer. In this case the imparting of personnel management skills is in second position (following EDP skills) in the commercial field - it was described by 83% of companies as "very important" or "important".

Analyses on in-company continuing training by course participants, distributed according to groups of employees, confirm that there are still few discernible trends to suggest that these measures serve as an instrument for the further development of individual skilling potential close to the workplace.

4.2 In-company initial training

The close links between vocational training and in-company continuing training from the macro point of view have already been indicated elsewhere. However, this close relationship is also important with reference to personnel and skill development planning at the level of the individual firm.

The two large-scale restructuring projects of the 1980s (the restructuring of industrial metalworking and electrical occupations) redefined the qualifications of a skilled worker, or at least put down on paper a development which had already begun in many large-scale companies.

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[18] Weiss, R.: Die 26-Mrd.-Investition.., op. cit., p. 93ff.

Whereas in the previous vocational profiles, the definition of a skilled worker consisted of a sum of knowledge and competences, his qualification in the new training regulations is described as action-oriented and holistic: he should be capable of independently planning and controlling his activities and, as appropriate, correcting his working action.

As pointed out by an initial evaluation of the new training regulations, training design must be revised if such a training goal is to be achieved. Precisely in larger companies, this is also associated with considerations to give learning at company workplaces a larger role.

As far as the design of in-company continuing training is concerned, the described changes are significant to initial training from various points of view:

- If the training goal of the new training regulations is actually by and large achieved, the content of continuing training building on this level can and must be different in its design. Forms of learning close to the workplace meet with the relevant learning experience among those who have gone through the "new" type of vocational training. The concept of self-directed and self-responsible work is transferable to the definition of one's own skill gaps and the construction of learning configurations close to the workplace to bridge these gaps.

- The demand for in-company continuing training results from the need to train full- and part-time trainers. Finally, examination is necessary to determine whether a supplementary form of continuing training may be required for employees in this field following completion of the far-reaching type of restructured training affecting a substantial proportion of commercial vocational training.

4.3 Relations between personnel recruitment, staff development and the planning of skill needs

It is difficult to develop objective criteria for the determination of skill needs and, consequently for continuing training demand. The positions of both sides of industry point to the difficulty of such an exercise.

(Employers' side):
"The determination of qualitative personnel requirements, and therefore also of the demand for continuing training, is one of the most difficult tasks of company personnel management. [...] It is indeed questionable whether methodical instruments which are both "efficient" and "generally recognized" can be developed at all".[19]

The workers' position refers to surveys demonstrating that the in-company reality of skill requirement planning is extremely sparse. Even less frequent are approaches attempting to coordinate personnel planning with continuing training. The reasons for this unsatisfactory situation however are not considered to lie in instrumental or methodical deficits, but in a fundamental conceptual error in existing planning of requirements.

"Even if such planning models can be further finetuned and methodical and implementation problems scaled down, an essential deficit will nevertheless not thereby be eliminated, namely the logic inherent to such planning concepts which attempts to establish an equilibrium between skill

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19 Federal Minister for Education and Science (ed.): Betriebliche Weiterbildung....

op. cit., p. 34.

needs and supply, i.e. to bridge a 'skills gap'. Such a concept is faced with the fundamental dilemma of restraining, rather than expanding the adaptive flexibility and self-learning capacity of technical and social systems, as would be facilitated by means of e.g. a potential-oriented definition of training needs."[20]

This last reference brings us directly back to the field of investigation of the present study: intentional and spontaneous learning processes in the working sphere.

Although it is pointless to lag behind the process of technical change in precisely the field of changes in labour organization triggered by technical innovations with analyses of presumed skill deficits and continuing training measures, in-company decision-makers are not primarily concerned with finetuning the instruments for the analysis of demand and combining them with adequate continuing training models. It is rather a question of the development of an overall company strategy which at least in the short-term pursues a forward-looking personnel recruitment and development policy with greater reference to the qualitative dimension and prepares the overall workforce (including use of the instrument of in-company continuing training) for technical/organizational and technical/social change at the workplace. Concrete "skill gaps" emerging in the working process in the short-term would then be offset decentrally and informally.

4.4 The relationship between an overall company continuing training strategy and labour organization

Although the investment of the firms in continuing training shows increasing growth rates, most certainly reaching two-digit billion sums every year, there is nevertheless no homogeneous or predominant type of in-company continuing training strategy. Demand-oriented and potential-oriented approaches exist side by side. In most cases there is no strict division of tasks between the central training department and the decentralized iniatiator of training schemes. It is only recently that an organizational combination of personnel planning and continuing training planning with direct access to top management has gained in importance.

The simultaneity of decisions on investment in physical assets and "human capital" and their integration is nevertheless a prerequisite to prevent product innovation, changed labour organization as the result of new production concepts and personnel and skill developments from drifting apart.

These in-company decision-making processes must be detected in the analysis of processes of company change in the framework of the planned case studies. Examination shall be necessary of the extent to which friction was foreseeable, whether company "personnel and skill planners" have tried to centrally influence the reorganization of the working area, e.g. by the use of continuing training modules originating from the manufacturers and distributors of the new technologies, or whether the existing skills of the workers were built upon and able to develop as a process in the working sphere of technological and social restructuring.

4.5 The significance of company certification of training measures

There is currently no systematic, comprehensive evaluation of continuing training measures. Evaluation in this field is basically a question of learning and examination achievements, generally attested by certificates.

Taking all the forms of continuing vocational training (in-company, those funded by the Promotion

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20 ibid, p. 436.

of Labour Act, individual types) into consideration, approximately one half of all participants are awarded a certificate. The dominant forms of certificate are the "soft" forms of certification of participation and certificates issued by the training deliverer. Only every sixth participant receives an officially recognized certificate. These are in particular certificates in the field of upgrading training and retraining, generally awarded following courses involving considerable input of time. Although no quantifiable data are available on the segment of in-company continuing training, it can be assumed that schemes leading to certificates have minimal significance in this sub-segment.

These results demonstrate that, unlike initial vocational training, continuing training hardly ever leads to an improvement in workers' external marketability. This reduces the risk of employee mobility being restricted by a possible shift in in-company continuing training away from systematic courses towards more informal forms of learning.

A similar situation applies to the utilization of in-company continuing training as an instrument of in-company promotion. Although "preparation of members of staff for higher-level activities" was a "very important" target in 24% of companies and an "important" target for in-company continuing training in 56% of the companies included in the survey conducted by the Institut der Deutschen Wirtschaft on continuing training, this target was nevertheless only eighth among the eleven set objectives;[21] moreover, it tended to be encountered mainly in larger-scale firms.

Firms' interest in evaluating their training activities tends to be with a view to improving the cost-benefit ratio of their training schemes. The pressure for the legitimization of training expenditure from the business angle is rising. However, broadly-based in-company continuing training objectives render efficiency control more difficult. The trend towards continuing training close to the workplace may be less the result of the insight that in-company continuing training must be decentralized and flexible, and more an expression of the hope that such measures will be cost-effective and since more easily localizable, more easily accessible to efficiency control.

4.6 Corporate culture and in-company continuing training

It is interesting to note that the concept "corporate culture" describes a phenomenon to which above all the employers' side is attentive. This, combined with the extremely heterogeneous statements in the literature is a mixture of a distorted form of "public relations" for the hard world of "business" and the attempt to combine variables to describe corporate behaviour which cannot be adequately portrayed by economic motives alone.

Whereas e.g. in consumer research, the image of the "homo oeconomicus" was broadly expanded following the results of empirical social economics, the corresponding approaches on the interpretation of corporate behaviour remain largely diffuse.

What remains is the attempt to find models facilitating a pan-societal identification of the entrepreneur beyond the economic sphere.

Corporate culture has therefore become one of the regulatory policy standpoints of the Institut der Deutschen Wirtschaft:

"Continuing training and corporate culture: the improvement of economic conditions and the creation of economic work and lifestyles belong more than ever before to the aims of corporate action. Continuing training in the field of social policy cannot be dispensed with. It must be

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[21] Weiss, R.: Die 26-Mrd.-Investition ... op. cit., p. 74

deployed as a means of perceiving and better evaluating the environmental situation, in order to recognize potential conflict and to develop concepts of conflict management. Concepts of social policy continuing training which are open to problems can help to combine economic and technical progress with social and human progress."[22]

If this viewpoint is a reflection of the self-perception of some German employers, it should also impact upon the concept and design of in-company continuing training. Corporate culture should be manifest in the question of the introduction of new forms of labour organization and the acceptance of decentralized design and participation opportunities for the workers.

From analytical points of view, the strategies and active action of companies and employers must nevertheless be interpreted with a wider concept than that of corporate culture. It cannot be adequate to consider corporate culture from an instrumental angle as a strategic potential which may be used to explain or impact positively on company success.

It is not adequate to attempt to explain under-investment in continuing vocational training, excessively short-term training concept pespectives and the lack of flexibility in the design of labour organization by means of economically rational causes alone.

4.7 The role of in-company works councils

Consensus among the social partners is of outstanding importance in Germany as a regulatory principle in questions relating to vocational training. Instruments to achieve this consensus on the basis of an intensive process of discussion can be found with different tasks at all levels: national, Länder and that of the "competent bodies". The efficacy of these instruments and the equilibrium between the two sides of industry in their application is a bone of contention between the social partners.

It is an uncontested fact that workers' representatives have much less influence in the continuing vocational training sphere than in the field of initial vocational training. This chapter focuses on the influence of works councils at company level. Subsequent chapters shall go on to discuss the role of the social partners at regional and national levels (Chapters 6.2 and 6.4).

The Labour-Management Relations Act provides the legal framework for the scope of the co-determination granted to the works councils elected in the firms. Legal limitations stem from the definition of continuing vocational training and the restriction of co-determination in accordance with section 98, Labour-Management Relations Act, to "the implementation of vocational training measures". Alongside this, there is the right to object to the "appointment of a person entrusted with vocational training" and a right of proposal for the "participation of company workers or groups of workers in vocational training measures".

The definition of continuing vocational training

According to the jurisprudence of the Federal Labour Court, the term "in-company vocational training" is limited to "company-, plant- and workplace-related instruction without any occupational frame of reference". For this reason the question of the need for works councils to participate in the framework of learning processes at the workplace is disputed, quite apart from the fact that such influence would presumably be difficult to shape and regulate at the level of informal learning processes. Moreover, according to the Labour-Management Relations Act, the co-determination

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22 The Federal Minister for Education and Science (ed.): Betriebliche Weiterbildung ... op. cit., p. 7.

rights of works councils do not extend to the evaluation of the need for training measures close to the workplace, but in cases in which the company deems such measures necessary, co-determination governs their implementation. Given the open character of the learning processes, this set of instruments is clearly robbed of its value when it is precisely the workers themselves who determine the skill needs and design the measures to eliminate the deficits.

Legal limitations of co-determination in the field of in-company continuing training

It is important to note that the Labour-Management Relations Act envisages staggered forms of works council influence according to the circumstances in question. Three stages of influence are relevant to questions relating to continuing vocational training. With reference to the implementation of continuing training measures, an enforceable right of co-determination exists, i.e. in-company training policy makers cannot design the organization and content of continuing training measures without the approval of the works councils. However they may completely dispense with the implementation of in-company continuing training schemes if they are of the opinion that the conditions set by the works council would distort the envisaged measures in such a way that they would no longer correspond to their original ideas and objectives. Insofar there is no compulsion to reach a consensus, despite the existence of the right of co-determination.

As far as the appointment of in-company continuing training staff is concerned, there is merely a right of opposition, subject moreover to extremely narrow constraints. With reference to the selection of participants, the Labour-Management Relations Act provides the weakest instrument of exerting influence, the right of proposal. From the purely legal point of view, therefore, the scope of works councils in the design of continuing training measures is extremely limited.

Real limitations to co-determination in the field of in-company continuing training

Further problems stem from the real utilization of the existing opportunities:

- Elected works councils are only to be found in some enterprises. In particular a majority of small and medium-sized firms have no works councils and the Labour-Management Relations Act does not even provide for the election of a works council in companies with a workforce of nine or less.

- Important aspects of in-company continuing training, e.g. the determination of the purpose of the scheme, its duration, the date of its conclusion and technical admission requirements, are not covered by co-determination. Since moreover most firms do not have at least a medium-term continuing training plan, influence is in actual fact extremely limited.

- In-company training, and in particular continuing training, has no special status in the eyes of those representing the workers' interests; the emphasis is clearly on working hours, wages and salaries. Works councils competent and proficient in in-company training matters are few and far between.

- Works council members tend to represent the interests of skilled workers and it would therefore simply not occur to many of them to devise training plans for groups of workers to whom they are not particularly close. For this reason works councils seldom make any contribution to in-company training of unskilled and semi-skilled workers and remedial in-company continuing training is therefore of no special significance in German industry.

4.8 The funding of in-company continuing training

Regardless of whether the training courses are implemented internally or externally, the funding instruments of in-company continuing training are as follows:

- ◊ release from work with the guarantee of continued wages/salary and
- ◊ subsidization of direct continuing training costs.

Companies active in the field of training cannot limit the advantages of investment in training to their field of activity alone. The contents of in-company continuing training are therefore primarily geared towards furthering the interests of the company in question, and transferability of skills to other companies is therefore considerably restricted or ruled out.

Adaptation of workers' skills to changed circumstances at the workplace is very clearly to the fore. In-company continuing training and the funding of such measures in individual firms tend to reinforce the imbalances created in the context of school-based and in-company initial training. The buck is thus passed to public funders and the federal manpower services as far as the compensation of training deficits is concerned.

Against the background of company financial considerations, the following trends can currently be observed:

- ◊ Companies are trying to at least partly shift continuing training schemes into the non-working time of their employees, a strategy particularly observed in cases in which continuing training measures lead to qualifications which are transferable outside the company. In the case of the more highly skilled and better paid groups of employees, this strategy makes sense, continued payment of salaries being the highest cost factor of continuing training measures.

- ◊ The firms are increasing the proportion of continuing training measures on the job since the direct costs at this level are lower than those of courses in in-company or external continuing training centres.

5. REGIONAL TRAINING AND CONTINUING TRAINING STRUCTURES

The training policy debate on vocational training questions is becoming increasingly characterized by the phenomenon of regionalization. The differences in the training structures of the individual Member States of the Community are evidently larger than the differences between the actual countries. National vocational training policies are also being increasingly geared towards structures below national level and characterized by trends towards decentralization. Since unification, these developments certainly also apply to Germany, where for example the training market situation is completely different, both globally in the relationship between supply and demand, and structurally, e.g. in the spectrum of training occupations provided. In the Land of Brandenburg, e.g., more than a half of all training places were completely or largely financed by public funding in 1991.

All in all it must be stated that vocational training research in the continuing training field has so far devoted little attention to regional aspects, in particular the links between internal and external training provision.

In particular for small and medium-sized businesses, regional provision by the chambers and associations is of major importance. This field requires further examination to determine whether

and to what extent this provision makes up for the inadequate provision of internal continuing training infrastructures. A further question is whether large-scale firms which play a significant role at regional level also dominate and shape the content of regional continuing training opportunities.

6. NATIONAL VARIABLES EXPLAINING THE DEVELOPMENT OF TRAINING AND CONTINUING TRAINING STRUCTURES

6.1 Legal framework conditions

Whereas according to the principle of Kulturhoheit, the legal regulation of education and higher education is the scope of the Länder, the competence of the federal government for the regulation and design of initial and continuing vocational training is derived from its responsibility for the regulation of economic and labour law. Moreover, the social partners also have the opportunity of deciding upon rules on the basis of consensus which are then applicable to their particular sphere (cf. Chapters 6.2 and 6.4).

Legal provisions relating to continuing vocational training at federal level are primarily oriented towards individuals, for whom legal or financial entitlements are created or consumer protection regulations are passed.

The Vocational Training Act of 1969 regulates non-school-based continuing vocational training. This Act empowers the chambers of commerce ("the competent bodies") to issue examination regulations, on the basis of which examinations can be held and certificates awarded. The examination requirements are regulated, but not the means of preparing for these examinations. Moreover, the federal government may itself issue uniform further training and retraining provisions at federal level. These regulations stipulate not only the design of the examinations, but also their content, duration and curricula.

At the moment (1992), there are 1 318 further training regulations issued by the "competent bodies". In actual fact, these only affect approx. 268 different further training occupations since many chambers have issued regulations with the same content. Further training leading to the "master's certificate (Meister)" is predominant as a typical form of upgrading training in Germany in the approx. 170 federal regulations on further training.[23]

The Vocational Training Act does not cover the field of updating training, which constitutes the main thrust of in-company continuing training in Germany; this also applies to the other legal foundations of continuing vocational training.

All in all, it can be stated that in-company continuing training is at present only subject to the regulatory influence of the state if it involves either preparation for a certificate or if the company in question intends to apply to the federal manpower services for financial assistance in the implementation of its continuing training schemes. Neither of these conditions currently applies to the field of training measures on the job.

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[23] Bundesinstitut für Berufsbildung (ed.): Die anerkannten Ausbildungsberufe ... op. cit., pp. 354ff.

6.2 The role of the social partners

Approaches attempting to clarify questions relating to in-company continuing training on the basis of collective agreement are discussed below (see Chapter 6.4). Beyond the field of collective bargaining, a dialogue takes place between the trade unions and employers' associations in the vocational training committees, at the levels of the "competent bodies", the individual Länder and the "Main Committee" of the Bundesinstitut für Berufsbildung. The Main Committee, in which both the social partners, the federal government and the Länder are represented, has the task of advising the federal government on essential vocational training issues. In actual fact, over and above its advisory function, it exerts considerable influence on the shaping of training regulations in the field of initial vocational training. The absence of regulations on continuing training structures (see Chapter 6.1) naturally restricts the actual influence of the social partners in this field. Their essential instrument at national level are recommendations and statements which gain in weight if supported by both sides of industry.

In contrast to the situation with respect to structural issues within the dual system, there is no basic global consensus in the field of continuing vocational training. This situation has been evident in the past on various occasions regarding questions of principle, e.g. in the minority report of the workers' delegate on the position of the Main Committee on the vocational training report of the federal government in 1988. Whereas in the position of the Main Committee the subject of continuing vocational training is merely touched upon in passing (it being recommended that in the future the federal government address greater attention to questions concerning the relations between initial and continuing vocational training), the workers in their minority report criticize the fact that the federal government has no overall continuing training strategy:

"A long-term, clear continuing vocational training stategy is necessary as a public task. Present general continuing training practice is to the detriment of the workers.
[...] There is no sign of a continuing training strategy on the part of the federal government such as that demanded by the unions, creating equal vocational and social opportunities, targeted towards social management and shaping of technology and giving the workers and their unions the right to co-determination."[24]

6.3 Effects of global funding structures

The three essential sub-areas of continuing vocational training were outlined in Chapter 2 and classified according to the origin of their funding and, in relation to this, their target groups. Overlaps in in-company continuing training, publically funded continuing training and individual continuing training efforts are not an expression of synergies between these areas, but usually the result of the attempts of the original financier to reduce his own costs by a form of co-financing, without having to suffer inroads into his own objectives.

Since the individual financiers have different interests when it comes to skilling, the sub-segments constitute organizational and structural conditions facilitating the realization of the training interests of the various players. The partial overlap in skilling interests has led to complex co-funding systems in many countries. A specific training objective and the measures attributed to this objective may be achieved by alternative funding arrangements.

Learning processes in the proximity of the workplace in the framework of continuing vocational training are gaining in importance for both the firms and for the workforce in the light of the

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[24] The Federal Minister for Education and Science (ed.): Bildungsbericht 1988. Bonn, 1988, p. 19.

processes of technical and social change. Creative changes in labour organization are also in the public interest, in particular if they serve to nip imminent unemployment in the bud in the areas effected by the change. The question therefore is whether it will be possible in the future to specifically target trends towards the link-up of sub-areas of continuing vocational training and to draw on continuing training close to the workplace as a platform for such a development.

"The segmented parts may be linked together with reference to common aims (e.g. an increase in participation in continuing training) and developed to form a single system; this will serve not only the orientation of all those participating in continuing training, but will also and in particular facilitate the action of the 'market participants'".[25]

6.4 The importance of collective bargaining

The following types of rules relating to continuing training can be differentiated in collective agreements:

◊ Provisions on release and funding, so-called eduational/training leave:

At the moment there are over 200 collective or works agreements containing provisions on training leave.

◊ Continuing training in the framework of rationalization protection agreements or in conjunction with social plans:

Various agreements on protection from rationalization measures regulate the extent to which workers whose jobs are affected by technical innovation are to be re-trained or to receive continuing training. These regulations refer to concrete cases and processes of change in specific sectors; the adaptation measures are temporary. Since it is generally a case of workers threatened by unemployment, the costs are fully or partially offset by the federal manpower services.

◊ Continuing training as part of work in the framework of skilling agreements:

The "collective agreements on skilling" are a new type of regulation geared towards comprehensive, preventative training concepts as part of the human design of work and technology.

The following areas are to be regulated in this context:

- Workers' entitlement to paid continuing training phases during working time and throughout their overall working lives.
- The improvement of the works councils' right to co-determination in the implementation of in-company continuing training.
- Labour organization design with the aim of providing workers incentives to build their skills in the context of their work.
- The link-up between participation in continuing training and wage and salary entitlements.

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25 An analysis of the cost and funding strutures of continuing vocational training by Grünewald, U. and Sauter, E. can be found in: CEDEFOP, Vocational Training, 2/90, p. 31.

Various company agreements which fall under the scope of the IG Metall (metalworkers' union) include the points described and may offer a solid basis for standards governing learning processes at the workplace.

7. THE CONTEXT FOR THE ANALYSIS OF LEARNING PROCESSES AT THE WORKPLACE

The description of the framework conditions for in-company continuing training has demonstrated that learning processes in the working environment are highly complex and may be derived from the interdependences between technical and organizational changes, changes in labour organization, changes in skill requirements and related changes in skilling strategies.

The planned in-company case studies are based on the design of learning processes, be they:

- ◊ learning processes in a working context
- ◊ learning opportunities in the proximity (in terms of space and time) of the workplace
- ◊ a demand for learning triggered at the workplace which must be covered with reference to workplace conditions
- ◊ a set of new methodical concepts related to the workplace
- ◊ a close combination of learning and working phases in the framework of problem solutions
- ◊ the result of learning needs defined by either individuals or a work team
- ◊ a potential-oriented preliminary qualification which as a supplement to possibly existing vocational training renders learning processes close to the workplace or on the job possible.

Jobs and job design are closely related to the learning processes which are the focus of our attention in this context, whereby examination is necessary as to whether and to what extent jobs can be designed along the following lines:

The workplace is conducive to learning if it:

- ◊ is diversified (with reference to the processes applied, the tools used, flexible working hours and the complexity of the tasks carried out at the workplace)
- ◊ is challenging (i.e. forces the individual worker to flexibly contribute and permanently build his skill potential)
- ◊ is holistically related to the theoretical fundamentals of the production or service process
- ◊ corresponds to the interests and skills of the workers, in particular with reference to the contribution of skill potentials to job process design
- ◊ allows a certain degree of scope for decisions on the application of different working methods
- ◊ offers the opportunity of recognition of its aims and significance in the company as a whole and within society in general.

Whether and to what extent workplaces conducive to learning will determine the future reality of the firms depends on the framework conditions within the department and the company and the regional and national context.

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SECTION TWO

CASE STUDIES

ENTERPRISE A - Dr. Uwe Grünewald

ENTERPRISE H - Edgar Sauter

ENTERPRISE K - Gerhard Zimmer

CASE STUDY IN ENTERPRISE A

1. INFORMATION SOURCES

The case study report is based on interviews with staff members, the assessment of written material provided by the enterprise and information gathered on visits to two of the enterprise's operational areas (railway technology and power electronics).
The interviews which, in part, lasted several hours were conducted in line with an interview guide between 14 May and 1 June 1992. They focused on the following areas:

- ◊ Which technical process and production innovations have been implemented recently?
- ◊ What repercussions has this had for organizational changes with regard to tasks and the decision-making and hierarchical structures?
- ◊ What implications have the technical and organizational changes had on the qualification needs and the qualification potential?
- ◊ How did the enterprise and/or the organizational unit react to the new qualification needs and potentials?
- ◊ What changes with regard to structure and content have taken place in in-house training?
- ◊ General description of the enterprise
- ◊ General description of training

Interviews were held with the following:

1. A group talk with:
   - The head of the education sector
   - The head of training
   - The head of sector "Power Electronics"
   - The head of sector "Railway Technology"

2. Individual talks with the heads of enterprise, two heads of sector in Railway Technology and Power Electronics.

2. CHARACTERISTICS OF THE ENTERPRISE

Enterprise A with several locations in Berlin and which was the subject of the case study is an electrical and electronics enterprise and a large international firm. It is involved in automation technology, railway systems, electrotechnical plant and components, household appliances and microelectronics.

The enterprise employs some 6 000 staff in Berlin, distributed among six municipal locations. The staff comprises some 2 000 engineers, some 1 000 sales representatives and 1 600 skills workers. There are some 1 400 unskilled workers and staff trained on the job. In the various operational sectors the individual enterprises are autonomous.

At the end of last year, the enterprise employed some 76 338 staff world-wide and had a turnover of 16 billion DM. In 1991 some 767 million DM were devoted to research and development. The operational sectors examined in the case study were "Power Electronics" and "Railway Technology".

In the "Power Electronics" sector transmission systems, an important fundamental technology, are developed and produced.

These form the link between computer and information systems on the one hand and prime movers and driven machines on the other. The "Railway Technology" operational sector develops and produces transport systems in use throughout the world. The firm was involved in producing the "Banana Railway" in Costa Rica, the underground and municipal railways in Berlin and in equipping the ICE high-speed trains of German Federal Railways with traction motors.

3. GENERAL DESCRIPTION OF INTERNAL TRAINING

3.1 Vocational training

The central department for training and further training is responsible for all training measures for the Berlin locations.

At present some 450 young people are undergoing training. Annually the 100 - 120 recruited apprentices are trained for 20 different professions whereby the metal and electricity sectors dominate. Training is also given for sales representatives and to a lesser degree for technical draftsmen.

Recruitment is coordinated with the various operational sectors. The numbers recruited ensure that they can be offered employment by the enterprise upon completion of training.

On the medium term, the demand for apprentices is decreasing. Rationalization measures are beginning to take effect and in industry there is a general trend to relocate from Berlin. Both phenomena are a general trend in the Berlin economy and are not specific to enterprise A.

In Berlin the training deficit of applicants from the new Länder causes problems. In the opinion of the head of training, recruits from the new Länder have enormous gaps in their knowledge. School leavers from the POS (Polytechnical grammar school) and the EOS (Extended grammar school) do not have the educational level of west Berlin secondary school leavers. However, this has not resulted in the enterprise requiring applicants for electrical professions coming from the former GDR to have university entrance qualifications.

3.2 In-company training

With regard to further training, there is a tendency towards rendering training needs more tangible. An analysis of training needs is carried out every two years and thus the enterprise has been successful in discarding so-called "repair training". Innovative further training should prepare staff for the introduction of new technologies.

Of the some 6 000 employees in Berlin annually about 2 000 participate in training courses. The latter are administered by 40 employees of which 23 are responsible solely for further training. A training programme is drawn up twice per year and reflects the current needs of the various operational areas. This programme is for all employees and is wide in scope. In addition to this, the particular training needs of individual production sectors are also catered for. This guarantees close coordination with the enterprise's need for trained personnel. The decreasing number of apprentices has not led to an increase in training activities. Participation in training remains fairly constant. The high quality of the broadly-based initial training in the enterprise disposes of a need for adaptive training in the case of minor changes to the enterprise structure. Training costs are not broken down. The training contribution which every operational area pays annually in the internal accounting system for each staff member amounts to 360 DM. This meant that annual

costs for each participant lay at approximately 1 000 DM.

Whereas there is a general trend for training activities to increasingly encroach upon employee's leisure time, in enterprise A in Berlin the proportion of courses held during working time has increased. This can be accounted for by an increase in two particular areas: in data processing and in language training. Fusion with an American partner in the area of railway technology has evoked the need for a large proportion of employees to learn English. For corporate reasons both areas were extended so that the need for qualification took precedence over considerations to move training to leisure time in order to save money.

4. Changes in qualification needs as a catalyst for qualification processes closely related to the workplace

In enterprise A there were two training concepts in various sections which was aimed at workers already possessing qualifications. The scope given to the manager to organize on-the job-training resulted in differing solutions being found to respond to the main skill needs and learning opportunities in the two sections.

4.1 The point of departure

A few years ago vocational training in the electrical sector in Germany was reorganized. The predecessor of current training was training in various levels to an electrical/electronics skilled worker after three and a half years. The first level of electrical appliance mechanic being attained after two of these years. After the initial two years of training for a skilled worker, a portion of the apprentices were given employment in a lower wage group as within the enterprise the number of training places for the second level was limited.

After several years of employment following the two years of training as apprentices there was a need to adapt the qualifications of these employees to the changing requirements of the workplace both with regard to basic knowledge in electronics and more general skills (initiative, quality consciousness). Dependent upon the technical and organizational structure of production and on the specific restructuring of work organization, the problem of the depth of training for electrical appliance mechanics was solved in different ways in the two operational areas. This case study focuses on describing the various training measures in the power electronics sector and the railway technology sector, the background to the various solutions and the consequences of these qualifications.

4.2 Formal theory-related training in the power electronics sector

In the power electronics operational area, the increasingly complicated production processes in the electronics area place constraints upon the deployment of employees who had only two years of training. Particularly in wiring conductors, theoretical knowledge was insufficient to facilitate independent work. A training concept was formulated with the help of the works council. The training measures formulated were then offered by the central training department to employees outside working time. A total of 15 employees showed great commitment in taking part in the training course.

Work organization modifications were only of peripheral importance as the production process was reorganized. A factor resulting in limited learning opportunities in the power electronics area is the decrease in productive skills which played a minor role in railway technology. Following this reduction in skills the homogenous nature of the skilled workers increased greatly as in the power electronics operational area there was a spraying shop, cutting and punching area, a turning shop, a fitting and a welding shop. Of a total of 90-100 employees in the mechanical preliminary

production area only 7 remain in a small metalworking department and these comprise metalworkers and mechanics. The remainder were redeployed in other production sections.

The organization of training

The works council initiated further training for 10-15 electrical/electronics mechanics. As qualification constraints became clear, they demanded further training courses. Management offered in-house training outside working time. From the outset certification of the qualifications played an important role. The central training department was given the task of organizing training which led to an examination set by the Chamber of Industry and Commerce for a skilled workers certificate as electronics/electrical mechanic which is recognized beyond the enterprise.

The management of the workshop originally believed that with the help of the central training department they could carry out a training course to deepen the content of training given at the first level. It was the aim of the enterprise to instil understanding of the need for certain regulations on production procedures. The course aimed to train skilled workers for wiring and assembling electronics equipment. The necessary skills were taught in the first level of training but these had not been built upon sufficiently. Through the intervention of the works council, the training course turned to focus on the electronics examination. Initial plans to complement training through on-the-job training had to be omitted on account of the high proportion of theoretical knowledge required for the electronics examination.

The consequences of training courses

The course was well attended and consisted of two groups of ten participants. Four dropped out during the course. In the course the younger more active employees who had completed the two year training course were predominant. A total of one third of all electrical/electronics mechanics employed in the enterprise took part in the course. All of them had worked previously in the workshop department. Even if the course did not aim to prepare employees for a more demanding job in the testing department (in comparison to workshop assembly), several qualified to work in the testing department. Such career development would not have been open to them had they not taken part in the course. The remainder of the participants in the course were also able to apply their knowledge, if not in its entirety, in their work. It is possible to assess the usefulness of the course from the point of view of the enterprise as the first course finished a year and a half ago and the second course a year ago. Production procedures have not changed. However, staff potential for certain tasks within the existing organizational structure has increased. The degree of adaptability to differing tasks has grown. In addition, it is easier to introduce employees to more complex work. While previously only staff with three years of training could carry out more complex tasks in electrical assembly and wiring, many more can now carry out these tasks. As the workshop comprises some 200 employees, who are partly trained on the job, the 20 participants who successfully completed the course are an important supplement to the labour force. The fact that the certificate awarded at the end of the course is also recognized outside the company gives the course participants better perspectives.

4.3 Group training closely related to the workplace

In the railway technology operational area the point of departure is a different one for the employment of electrical appliance mechanics who had received only two years training. The lack of theoretical knowledge in electronics was of significance. But of greater importance were qualifications obtained at the workplace. As the head of the operational area stated:

"We have some 10 mechanics trained over a two year period. We would have preferred 3 1/2 year training, but some of them were unable to continue training as after two years they had a

mark of 3.5 and thus could not continue training. They were however also offered contracts and remained in the enterprise and in part they are better qualified than the 3 1/2 year trainees and work independently."

The decision to integrate the training of electrical appliance mechanics into the working process stemmed from the small scale nature of production. This rendered training at the workplace a requirement and facilitated the learning process at the workplace. In addition, in railway technology, maintenance and repair work must be carried out under considerable time pressure and entails a high degree of responsibility in close contact with the customer. This required a high degree of specific and less specific training which could not easily be divorced from the workplace. An additional important factor were cost/benefit considerations on the part of the management.

The organization of training

The head of training assesses positively work periods in other large enterprises where group work is an important part of training at the workplace as is the ability to organize oneself when learning on the job. This has not yet been attained in enterprise A. Such work periods are a matter of course and are a frequent phenomenon in the railway technology sector. This signifies that electrical appliance mechanics, under the guidance of experienced electronic technicians in small groups are "thrown in at the deep end".

There was little time for practice and the group started immediately on actual production work. At least in the initial phase additional training courses are offered and the theory, as far as is possible, should be explained by the group leader on the job. It is the opinion of the head of the operational area "railway technology" that a great deal of tact in putting together groups of 34 employees is essential to ensure successful learning.

The group leader is also the foreman who is responsible for meeting the deadlines and for quality control. Quality control is also carried out within the group using a protocol system. Employee A assembles and wires the product, employee B from the same group controls the screws and signs that the product has been tested. This is a means of instilling a sense of responsibility among employees.

Consequences of training courses

On-going introduction to tasks requiring greater skills and contact to other staff and customers is the result of training courses close to the workplace. Employees who, previous to working in the group, had little independent work experience have made considerable progress. In this context, the head of the Railway Technology operation area states:

"We all committed ourselves to pursuing this path together. It is a matter of convincing others of its merits. We attempted to introduce the employee slowly to work and today he is involved in developing a prototype of the new 120 locomotive. 2 1/2 years ago, I had trouble with him. This is not meant in a negative way. He did not understand but in the meantime through tackling tasks in practice, the penny has dropped."

For the individual concerned in this example, the training course had enabled him to be placed in the same salary group as a trained electronic technician. In the view of the head of the enterprise, the financial incentive is important, as is ensuring that the work is interesting and provides sufficient challenges. This is possible in view of the small-scale nature of production. Examples show that training in groups close to the workplace leads to further in-company training courses and career developments. It is the theory which forms the barriers. These can only be surmounted through further theoretical training courses which thus close the circle of varying training concepts.

CASE STUDY IN ENTERPRISE H

1. DATA SOURCES

The case study report was compiled on the strength of oral interviews with members of staff, the analysis of written material provided by the company and the information collected during a visit to separate factory workshops (body, assembly).

The interviews were conducted according to an interview handbook in April/May 1992 and lasted several hours in some cases. They focused on the following topics:

- ◊ which technical innovations were carried through recently with regard to processing and production?
- ◊ which were the ensuing organizational changes with regard to work, decision-making and hierarchical structures?
- ◊ which new developments have taken place in qualification requirements and potential as a result of the technical and organizational changes?
- ◊ how did the company and/or the organizational unit respond to these new requirements and potentials?
- ◊ in-house further education: how is it structured and what is on offer?
- ◊ characteristics of the company

The following persons were interviewed:

- head of the education division
- head of the further training section
- subdivision manager of the body cost centre
- worker (plant electrician) in the body plant

2. COMPANY PROFILE

As part of a large car manufacturing group active world-wide, the company (enterprise H) produces commercial vehicles, primarily transporters (Type 4) and light lorries. The firm is the leading transport manufacturer in Germany, striving toward a 40 % market share.

The present market situation is characterized by a sharp rise in demand on account of the new economic conditions generated by reunification. The evolution of the market in the near future (4 to 5 years) is viewed with scepticism. Two thousand jobs are expected to be cut in the coming years in the works.

The factory employs approximately 19 000 workers, of which 18% are of foreign origin. The average age of the workforce lies around 40, with more than half in the 41+ age group. The company trains some 700 apprentices and takes on 250 new ones per year. Training is provided for 16 different professions, the priority being given to those involving mechanical engineering, electronic engineering and control technique.

3. INNOVATION OF PRODUCTS AND PROCESSES

The works are divided in cost centre sectors (e.g. forging plant, body plant, paint shop, injection moulding plant). The production plants are to a large extent automated. The entire technological upgrading of work processes is related to a single product, the new transporter, T 4. The innovative cycle for a model is planned for a period of 4 to 6 years. The development of the T 4 is set in the context of a technological innovation drive affecting virtually all the aspects of production and labour organization. In the body plant alone, for instance, about three times more robots were installed than for the previous T 3 model.

Such an enormous capital expenditure for the development and production of a new model is regarded as being typically European and too costly. Consequently, a more Japanese approach to car manufacturing will be introduced in future, allowing continuous or gradual upgrading of both technology and products.

As far as adjusting workers' qualifications is concerned, the combination of a new product with fully new production techniques and processes also are seen as being fraught with risks.

4. CHANGES IN LABOUR ORGANIZATION

The starting point for all operational changes in connection with the outlined innovation for both product and process is the notion that the technological potential for further streamlining and cost-cutting measures has been largely exhausted. Effective optimization is regarded as possible only when coordinating changes in technology, labour organization and worker qualification.

In line with the process of technological adjustment, the subsequent operational innovations are generally introduced or pursued:

- group work
- reduction in management staff
- integration of tasks

These measures are tightly intermeshed. They require a new understanding on the part of all those involved and a partial redefinition of roles.

Group work was instituted in the factory "from above" and, under the company's 1989 General Agreement, consists in:

- "cooperation between a set number of company staff in integrated tasks,
- delegating well-defined functions to the group,
- allowing for greater scope of action and decision, as well as opportunities to communicate in order to increase productivity and job satisfaction,
- group problem-solving."

The production cells (e.g. in the body plant) each comprising an average of ten collaborators with varying formal qualifications (unskilled, semi-skilled and skilled workers) provide the organizational structure for the introduction of group work. The members of a given production cell perform various tasks (e.g. plant manager, plant electrician, preparator, quality inspector, machine operator) which they can interchange.

The decisive step for group work is when the production team takes on activities in addition to manufacturing. Those include, among others, quality assurance, maintenance, management and control.

Job integration is accompanied by the following organizational changes:

- ◊ flattening of hierarchy
- ◊ decentralization of maintenance
- ◊ new participation rights and procedures

In concrete terms, hierarchical flattening consists in removing the position of deputy foreman and redefining the role of the foreman. As a rule, the deputies accede to the role of foreman. The number of chief positions was raised to approximately 600. In the past, the ratio of foremen to workers was 1 to 90, or higher, whereas now it has come down to about 1 to 30.

The foreman's new role is characterized by the following features:

- ◊ spirit of enterprise
- ◊ full sense of responsibility
- ◊ customer-oriented approach

Decentralizing maintenance specifically means that up to 80% of the arising disruptions - not the volume of disruptions - must be remedied within the group. Complex disruptions alone remain the responsibility of the main shop, as before.

The team organizes a range of tasks for which it assumes responsibility. Those include, among others, coordinating the holiday schedule, organizing the work distribution in the group, particularly in times of understaffing due to illness or holidays. The team speakers acts as a group moderator and representative outside. He has no leadership function and is elected by the team. The function of team speaker brings no financial advantages, however, it is acknowledged that it implies additional work.

The team speaker arranges for group decisions and acts as a speaker during contentions which may arise when coordinating work with neighbouring groups or production cells, for example. The group representative performs the role of foreman to intervene only when no consensus can be reached over contentions within the group.

In view of the relatively short time that has passed since introduction of team work no conclusions can be drawn about group behaviour, for example, what brings about a change in group spokesmen. it is evident that self-control within the group has reduced the reponsibilities of the foreman.

Training staff provide advice when the groups are set up and spokesmen elected. Groups need time to gather experience to produce satisfactory results, for example, to find out the characteristics required of the team spokesmen.

5. QUALIFICATION CHANGES

Changes in qualification requirements ensue from the outlined technical and organizational innovations and are understood as a response to these new developments. To plan technological and operational innovations and simultaneously take existing qualifications as determinant is not a realistic option yet.

The new manufacturing plants require multiple technical skills, particularly in electronics, robotics, hydraulics, pneumatics and control technique. These skills are imparted in the context of an extensive, well-structured vocational training scheme (see 6.2) in accordance with the place of application, the target group and the qualifications required. Technical restructuring puts added pressure on some employees, for example, plant managers, robot operators, engineers who set or alter the welding programme and repair minor electrical and mechanical faults.

The new profile of many jobs, demanding more diversified skills and greater responsibilities, make it necessary to have extra-disciplinary qualifications along with specialized skills. Special emphasis is put on such abilities as, for example, reflected action, cost awareness, dealing with and operating in mixed occupational groups. Skills are knowledge can only be applied effectively when accepted by all in the group.

Employees' readiness to learn and their acceptance of training are particularly important for internal operational conversions. Trained workers are considered to possess the qualification potential needed for rapid reorientation and further training. Hence, they tend to be given priority in the production sector, although their skills are in part underused.

All members of staff and all levels of management are affected by extra-disciplinary training measures. Managers, such as the head of a cost centre for instance, must learn that they have to justify their action constantly and that they bear responsibility not merely for the number of pieces produced but, increasingly, also for personnel.

A striking example for the transformed role of superiors is that of the foreman. His loss of power is compensated by a new approach hallmarked by:

- ◊ mediation instead of command
- ◊ motivation instead of constraint
- ◊ dialogue instead of orders
- ◊ competence instead of authority
- ◊ joint decision-making and shared responsibility instead of handing down orders.

The members of working groups are faced with new requirements in the context of job enlargement or job integration. Furthermore, interdisciplinary group competence is called for to answer questions like "how to work in a team? how to deal with one another?..."

Administrative staff (marketing personnel, industrial managers, office workers, particularly in the purchasing and logistics departments, are also confronted with changed requirements. Specialists must be versed in both technical and commercial matters. This implies that those active in the logistics department must possess interdisciplinary knowledge related to all operations, from goods reception down to car fitting.

6. COMPANY RESPONSE TO QUALIFICATION REQUIREMENTS

Company response is reflected in a set of measures and activities relating primarily to information, training, strengthening personnel and organizational development.

6.1 Integration programme

An integration programme prepared employees for the forthcoming changes and informed them on the new product. A team of twelve executives drew up the programme which includes, among others, an information leaflet and a handbook. In connection with the programme, 300 foremen

acted as multipliers; in other words, they were involved in implementing the innovation.

The three and a half year integration programme covered a range of aims and steps. It focussed on improving information and communication and in increasing cooperation. Staff are informed of staff, technical and organizational changes to avoid loss of information as it percolates through the command line. Training aims to motivate staff to organize their workplaces and to solve problems and to be more integrated in the company.

The main parts of the programme included:

- ◊ information seminars for staff on new products and pending changes in the company, e.g. team work,
- ◊ an info-broschure read by some 70% of staff,
- ◊ meetings in and between department to boost cooperation,
- ◊ meeting when new products are introduced,
- ◊ factory tours to get to know the company better,
- ◊ constant reporting on what has been achieved.

There was no specific assessment of the programme. Comparsion of faults in new vehicles produced and earlier ones showed positive trends.

6.2 Technical training scheme

The technical training scheme focuses on conveying skills indispensable for the introduction of innovative technologies. This takes the form of standard seminars and project-based courses.

- ◊ The standard seminars (e.g. on pneumatics, hydraulics, electronics or robotics) have already been run successfully. As for any adult training class, employees can attend them once they have applied through the company. The teaching units are conducted partly at the plant where the equipment is manufactured, partly on-the-job or in factory workshops, and partly in lecture rooms in the training centre.

- ◊ The project-based technical training is organised in multistage courses tailored for each department with workers from the given plants. For the target group **electrical maintenance engineer/plant electrician**, this type of technical training, for example, involves:

- ◊ a six-hour information seminar

- ◊ a basic training course lasting a maximum of 720 hours (depending on existing qualifications and skills) which covers, inter alia, electrical components, applied metrology and circuitry, as well as training in diagnosis and cooperation

- ◊ a module on general knowledge on the plant of up to 59 hours

- ◊ a task-related consolidation course of up to 90 hours conducted on-the-job.

6.3 Group work as an organizational advancement measure

Group work is seen as a form of organizational advancement, the aims being to enhance job satisfaction and productivity. It draws in a lot of staff, though the actual effects could not be quantified in detail.

Group work was taken up and pursued as an organizational advancement strategy only after most technical gaps were filled. Training in labour organization started with diagnosis and cooperation modules.

Initiation to group work is conducted according to a seven-stage model over a period of about one year:

- ◊ survey and documentation of job satisfaction in the operational units concerned (e.g. body cost centre),
- ◊ creation of general conditions allowing team work (company agreement providing for group work),
- ◊ preparing managers to perform new tasks (e.g. workshops for foremen on "group management",
- ◊ preparing employees for group work (interdisciplinary training from the angle of job integration),
- ◊ beginning of group activities (electing the team speaker, setting up the group, first group talks, shaping the foreman/group relationship),
- ◊ project supervision by the education department (guidance provided on the spot by education specialists),
- ◊ survey and documentation of the situation after about 9 months (questionnaires, survey of small groups and group discussions).

6.4 Organizational improvement at executive level

Workshops are organized outside the company for top division managers, section managers, heads of division, heads of sub-division with the aim of enhancing cooperation. Concrete objectives coupled with realistic measures and commitments are agreed upon and the results discussed at subsequent meetings. So far the rate of success has been very high.

Success was gauged by the extend to which management initiated activities to cope with their tasks. There was no quantitative evaluation of this.

6.5 Ongoing improvement process

This concept does not relate to an isolated measure but rather combines all activities which reflect corporate identity, for instance, group work, work in specialist circles, quality enhancing measures, training of foremen, and a suggestion book system. Ongoing improvement process is to be understood as an "inner conduct" in so far as it denotes a certain company philosophy.

Ongoing improvement process is the preliminary conclusion of a development stretching from the suggestion book system, quality circle work down to group work. The individual identifies completely with his company and his working group, hence his interest in constantly improving the quality of his work. While proposals for possible improvement, stemming from the suggestion book system and quality circle, were as a rule rewarded, it became a matter of course (i.e. not remunerated) in the process of ongoing improvement. This development is reflected in the fact that circle work and ongoing improvement continue to exist side by side. Having said that, circle work is regarded as being too formal (it involves a set schedule) and time consuming. Ongoing improvement process (KVP) is the German equivalent of lean production.

The ongoing improvement process covers all activities, (quality circles, quality assurance, just-in-time, proposals, team work) designed to improve quality and increase the quantity of production. These activities still continue although new slogans are continually being coined.

7. IN-HOUSE FURTHER TRAINING

7.1 General trends

The following trends in the evolution of further training were established:

◊ the employee advancement, personnel and education divisions are getting closer.

In the course of restructuring, training was put under the control of the factory's personnel manager whereas previously it had been under the direct supervision of the central training division at the company's head office in W. However, a problem remains. Indeed, for reasons of strategy, employee advancement is carried out from head office in correlation with plant personnel managers which means that communication with the work's training section is only indirect. Acceptance of training in the production department has grown noticeably in recent years. In particular, it has won the support of cost centre managers because education helped them solve their problems.

◊ Further training is expanding. The annual overall budget for education has increased from DM 18 million to DM 25 million within the last five years. The expansion of further training is reflected in the reinforcement of full-time training staff which grew from 3 to 15 members in ten years. Staff is becoming increasingly decentralized and play an important role in introducing and seeing through innovation processes.

◊ Decentralization is gaining ground. The tasks and activities pertaining to further training are transferred increasingly to the production sector. The training section now assumes to a considerable extent the function of moderator when introducing and conducting organizational enhancement exercises (e.g. group work). It provides guidance to managers in defining and observing their new roles. More and more traditional activities, such as running standard seminars for technical training, are delegated to other divisions or taken over by external partners. This development also means that the share people involved in organizational enhancement among full-time staff is increasing at the cost of traditional teaching staff responsible for standard seminars. All in all, the future expansion of further training should no longer result in a quantitative rise in full-time employees. Indeed, on the one hand, training tasks are progressively being handed over to managers (e.g. for the introduction of organizational advancement measures) and on the other, cooperation with outside firms or services is growing, especially with plant manufacturers.

◊ The connections between vocational training and further training are becoming more apparent.

The factory employs a large number of middle-aged unskilled and semi-skilled workers. This potential could be trained to fit in the newly tailored jobs together with already skilled workers. In view of the emerging decline in demand for initial vocational training, the growing need for additional staff is met through further training. Generally speaking, however, the formal level of skilled worker is not aimed at and has not been attained.

A number of factors account for this:

- decreasing demand for training places (demographic developments, unattractive nature of the dual system compared to scholastic alternatives,
- the large number of workers without formal qualifications who have work experience gathered over a number of years,
- the surplus of posts which must be reduced in the coming years,
- the costs advantage of training on the job.

◊ The need for organizational improvement is growing.

The training section and its staff are taking part more and more in the implementation of organizational improvement measures in the company e.g. training multipliers, monitoring group work. On the other hand, standard seminars following the adult training centre model are losing ground.

7.2 Structure of advanced vocational courses

◊ Technical training

An almost comprehensive scheme to introduce new production plants.

Target groups are workers with no formal qualifications and skilled workers in the production sector.

The scheme (see details in 6.2) includes both on-the-job and off-the-job training. The programme was partially drafted and run by the plant manufacturers.

Furthermore, new courses are organized to meet urgent needs (e.g. 5-day seminars on new robot control systems).

◊ Training foremen

Foremen are a central target group, hence the variety of further training courses offered to them:

- extradisciplinary seminars of approximately 432 hours on various subjects (e.g. industrial law, management, communication, rhetoric, solving conflict),
- training for quality circle managers
  400 foremen were trained as quality circle managers during a one-week seminar (team teaching conducted by the education section in collaboration with division managers),
- cost seminars
  cost centre-related seminars of 2 to 3 days on questions of cost (backed and organized by the control and training departments).

Formal further training of new foremen was stopped in recent years. Individuals must complete an advanced training course in line with their occupation outside the company (e.g. technical college).

◊ Training in organizational improvement

The education department is involved in various ways in the company's organizational activities, for example:

- running seminars on organizational enhancement for executives (in cooperation with experts from outside)
- moderating, supervising, advising and training during group work,
- giving advice when production lines are to be divided into quality control circles,
- drawing up and supervising the "autonomous learning group" project in administration,
- backing up training courses for the introduction of production place management in the forging press plant.

◊ Teacher seminars

10 to 15 information seminars on the company's vocational training facilities and study tours of the factory are arranged for secondary and high school teachers (teaching potential applicants for initial vocational training).

◊ Induction schemes for new intakes

Cost centre-based training schemes (e.g. in the injection moulding plant) combining theoretical and practical parts in a total of up to 160 hours and completed in the course of five months. Practical induction is undertaken by experienced workers who act as so-called "tutor".

◊ Media-assisted further training

Five teaching bases, so-called teaching boxes, with two self-teaching programmes of 8 hours each which employees can use during their spare time (e.g. during work breaks). Acceptance of these teaching modules leaves much to be desired: instead of the expected 2000 users, only 600 have completed the programme to date.

The interactive video course on "statistical process control" is run with each shift in proximity to the workplace. Further interactive video classes are planned.

7.3 Learning by doing

In general, it is worth noting that the learning process initiated or organized by the company, particularly in relation to organizational improvement measures, is moving closer to the workplace and/or integrated in the work.

Already when cooperating with production plant manufacturers it became clear that the training packages provided with the plants could only be effective, i.e. accepted, if they had been adapted to company conditions beforehand.

It is impossible to even estimate the number of learning processes integrated in the work. However, the ensuing types of training were found:

- Organizational measures with a training content ought to be especially linked with the group work. the possibility to rotate within the group provides opportunities to learn different jobs.
- Individual tutoring measures with a training content are mostly found in the induction schemes.
- Group measures offering learning opportunities can be found in the quality control circles as well as in group work. While the training results of group work are directly invested in the course of the work, the learning processes for quality circles occur "only" in direct proximity to the workplace.
- Measures involving teaching aids are to be seen above all in the teaching boxes. They are used near the workplace, yet training processes are only indirectly integrated in the work.

Learning processes integrated into work are not specifically planned or utilized. They cannot be quantified as a part of in-company training. In this context there is a substantial need for research and development.

CASE STUDY IN ENTERPRISE K

1. INFORMATION SOURCES

The case study is based on interviews with enterprise staff, the evaluation of documentation provided by the enterprise and visits to workplaces.

The interviews which lasted several hours and which, in part, took place at the actual workplaces, were made in May 1992 on the basis of an interview guide. The interviews focussed on the following topics:

- ◊ Which technical process and production innovations have been implemented recently?
- ◊ What repercussions has this had for organizational changes with regard to tasks and the decision-making and hierarchical structures?
- ◊ What implications have the technical and organizational changes had on the qualification needs and the qualification potential?
- ◊ How did the enterprise and/or the organizational unit react to the new qualification needs and potentials?
- ◊ What changes with regard to structure and content have taken place in in-house training?
- ◊ General description of the enterprise
- ◊ General description of training

Interviews were made with the following:

- ◊ The head of the staff advancement department
- ◊ System coordinator
- ◊ Clerical staff in the office.

2. GENERAL DESCRIPTION OF THE ENTERPRISE

The enterprise produces and distributes worldwide technical plant and equipment for telecommunication: network and communication technology for public and private networks on the basis of copper and glass fibre technology. In addition, information and advertising signs (for example airport information boards) and electrical plant is produced. In 1991 the firm, including national and foreign subsidiaries, had a turnover of DM 800 million.

On a worldwide basis the enterprise employs some 4 200 staff. Two thirds (approx. 2 800) in Germany, 1 400 at site B, 1 000 at site H, 300 at site L and the rest in national sales offices and subsidiaries.

At site B, the headquarters of the enterprise, a new production centre was set up in the 80s at a cost of some 100 million DM in which "the CIM-oriented firm (...) has in essence been created". An office communications system was introduced for administration and some 760 workplaces are networked today. Every second member of staff has equipment at his workplace and some have been installed in the production area. A further 40 workstations have been installed in the national subsidiaries.

3. GENERAL DESCRIPTION OF IN-HOUSE TRAINING

For in-house training, expenditure increased tenfold to 1.1 million DM between 1978 and 1991. Some 2 million DM are allocated for 1992. This sum covers only training costs and the costs of seminars.

In-house training and further training and the development of staff is given the broad term staff advancement. For 1992 some 5 million DM have been allocated in total for staff advancement, this sum including all costs (absence at the workplace, apprenticeship pay).

The staff advancement department is staffed by a head of department and two assistants, one half-time. They plan and organize events and administer data on participants. This also forms a basis for planning staff development.

Participants in language courses and data processing courses also indirectly bear part of the further training costs through devoting some of their free time to these courses. The courses are divided half and half between working time and leisure time. This is based on the assumption that these courses are also in the personal interests of the staff. If courses are required purely for work purposes, a decision taken by the staff member's superior, then they are financed entirely by the enterprise.

4. PROCESS INNOVATIONS

The introduction of an office communications system which came on the market in 1981 commenced in the middle of the 80s. For the first two years an average of one workstation per day was introduced. In the meantime, some 800 workplaces have been networked by the system on a national basis. To give an example of the dimensions: the city of Vienna is to be networked with the same system for some 8 000 workstations, a prominent large enterprise in the south-east of Germany is also to install a similar system with 25 000 workstations. This networking "brings workstations close to the production process". Important texts or data produced by the administration departments are directly at the disposal of skilled workers and group leaders in the production areas and such data can be input directly at such points for the enterprise administration. There is a separate networked system for production planning and control.

The most important functions of the office communication system are word processing and electronic mail. Some 90% of users make use only of these two functions. Texts can be printed directly at the workplace and can also be sent directly to any workstation or any printer on the network. Texts can be processed immediately by other departments. Incoming mail can be sent directly to someone else should the recipient be absent.

Other standard functions of the system are database administration, spread sheets and graphics. Recently the database interrogation language FOCUS was introduced as was the spread sheet programme LOTUS 1-2-3. Increasing use has been made of these functions and programmes following the introductory phase.

For security reasons the network is completely closed. At no point can a user introduce a diskette. Thus there is no opportunity to use other programmes or to load data from external media. For this reason personal computers which are open systems are only used for specific tasks in the enterprise and are not connected to the office communication system.

The system can send texts as fax, teletext or telex to the normal postal services. As this is a break in the media used in that the recipient has a printout on paper, more and more firms are changing to electronic networking. Again here there arises the problem of data security.

For the use of the system the main problem is the manuals containing the help texts and system messages because these are often unusable, incomplete or even incorrect. For example, the description of how to take a document from the electronic mail and put it into the wordprocessing system for further processing is explained extremely badly. The user is forced to rely on his own inventiveness. The system coordinator has re-written the manual for various functions and uses this for training purposes. This obvious insufficiency in system documentation is explained by the fact that the authors of the manual are not experts and did not understand the system themselves. On account of the price war between software producers, it is to be expected that the situation will anything but improve. Re-writing system documentation for the particular needs of the enterprise, as other enterprises do, is too expensive on account of frequent updating of the versions.

5. ORGANIZATIONAL CHANGES

A differentiation may be made between two types of organizational changes: a) the creation of a post for system coordinator to help the user, and b) changes in the work processes and division of tasks between staff and management and their respective functions and activities.

The tasks of management and of secretaries have started to change fundamentally. To reduce the enormous amount of time wasted through dictation, revision, re-writing and proof-reading of texts, many management staff have gone over to writing their own texts and sending them by electronic mail. More lengthy texts, previously written by hand, as they were too complicated for dictation, are now written directly on screen. The quality of the texts has risen because they are corrected immediately and new ideas can be incorporated without delay. In the traditional division of tasks with dictation and writing up the texts, which took a great deal of time and often resulted in misunderstanding, has disappeared. This change in the division of work also requires management staff to be able to carry out some simple secretarial tasks, for example, cataloguing and electronic archiving of documents.

Secretaries have much less work involving writing texts from dictation or from hand-written texts. With the help of key words they create and formulate the texts independently. Thus they are increasingly becoming administrative assistants which does not mean that they are writing less. There are fewer posts for secretaries and the content of the secretarial tasks is also changing.

Communication is much more rapid through use of the office communication system. The time spent by documents waiting to be processed or delivered has been reduced by some 100%. In the enterprise a document arrives at its destination within five seconds, general information to all 700 members of staff takes about 1 minute and for deliveries outside the enterprise some 10 minutes is required as the enterprise has leased a slow and inexpensive line.

Several people can work on the same text simultaneously independent of where they are situated, thus making office work more efficient. On the other hand, the communication system has intensified office work. All members of staff have up-to-date general information on the firm and general documentation at their disposal. Distribution and sorting of printed documentation for the many hundred workplaces has thus been disposed of. The general information available to all contains regulations concerning the firm, important documents, on internal decisions, on the structure of the firm, on changes to pay scales, telephone directory, lists of those trained in medical assistance, general company information and important dates and even the weekly canteen menu.

In an electronic communication network control of data security and access to data is extremely important. For certain information staff members have various access permissions for writing, storing and reading documents which is regulated by the password hierarchy. For example, the canteen menu may be written by the cooks but may not be deleted by them as they could by accident delete other information. There is differentiation in access down to certain fields of databases. Every member of staff may, for example, change his telephone number in the telephone directory, but may not change the number of his staff post.

Classification for storage purposes presents a particular problem. For this purpose "drawers" classified either by topic or date are created. These "drawers" and the documents they contain must be given appropriate names so that they may be found again easily. Because of limited storage capacity, members of staff must decide immediately if a "drawer" or a document will be needed again or if it may be deleted. If a "drawer" has not been opened for a six-month period, the user is asked automatically if the "drawer" may be deleted. This has resulted in many members of staff filing printed documentation. The problem of electronic signature has not yet been solved, meaning that paper still has to be used for documents requiring this.

But it is not only the process of organizational changes which must be coordinated. There is need for coordination of document archiving (classification, documents names, archive administration), permissions, the sending of documents electronically to a large number of recipients and constant counselling and training for the communication system. This also includes organizational work in setting up a new workstation and monitoring the software market and choosing the software to be purchased. The latter decision is taken by the management. Decisive for this are surveys of software needs and structural analyses of wordprocessors for which the software is required. The post of system coordinator is thus a full-time job.

6. QUALIFICATION NEEDS

Changes in qualification needs has three aspects: the written nature of communication, formalization of the archives and independent "hands-on" learning at the workplace.

6.1 The written nature of communication

The use of communication technology is not limited to various software features, for example, wordprocessing, electronic mail, and data processing. For these the skills required are easily learned. Of greater importance are the actual changes in communication habits.

This change arises from the simple fact that information no longer appears on paper, but on the screen. At the beginning, many members of staff printed out everything they received by electronic mail because they were better able to read it on paper. The drafts made were also printed out as it was found easier to detect mistakes on paper than on screen. Staff were recommended to switch the system from processing status to reading status as they were then "mentally in a better position" to read what was written more precisely. This psychological trick changes reading habits.

Writing also represents another change in communication habits. All those using the system must be able to reproduce the alphabet on the keyboard. This is not a problem for typists and secretaries but for almost all other staff. Previously they had written only by hand or, usually in the case of management staff, had used a dictaphone. Many were unaware how a typewriter, let alone a wordprocessor, functioned and could be used. This qualification deficit was apparent particularly among two groups: skilled workers and group leaders in the production section and senior managers in administration.

The more accustomed staff became to reading and writing using the communications system, the greater were the changes in the qualification needs for secretaries. As already mentioned, administration skills are becoming increasingly required of them.

The written nature of communication required of all users that they obeyed grammatical rules. Though this may seem self-evident, it is not always the case. There were qualification deficits in this area among skilled workers and group leaders who were used to communicating for the most part orally. Their written communication consisted mainly of key words, data and sketches. Managerial staff was also used to the fact that their secretaries made legible formatted texts from their dictations.

The first requirement is that of giving the electronic document a meaningful name. This name enables the document to be stored, retrieved and sent by electronic mail. In the reference section, for example, many write "letters", "information", "already known", "for information purposes", etc. These, however, are not names which identify a document. It is of greatest importance that the name is not ambiguous not only for the person writing the document but also for the recipient who can identify its content when the message appears on the screen signifying its arrival in his "in-coming mail basket".

6.2 FORMALIZATION OF THE ARCHIVING

The electronic archiving of documents requires very different skills from the user than archiving paper documents. In the latter case a capacity for spatial orientation and structural perception facilitates retrieval of a document. Thus, individuals are even capable of retrieving certain documents from a chaotic pile of documents with relative ease.

In the case of electronic archiving this is not possible. "On account of the archive, individuals must reflect on the structure of their work and not only on its content." This refers to the organization of the archives of the individual user. The archive classified by date is not simple to use and requires precise work and deadline planning. Topic related archiving requires, on the other hand, a delimitation of the various topics orientated towards work aims. The identification of documents with additional information consisting of one or more key words also facilitates cross-accessing.

As many of the archive documents are required at more than one workstation, it is necessary to agree both at departmental and supradepartmental level on the organization of the archives by topic. Staff must be in a position under the guidance of the system coordinator at "a round table to agree upon a standardization for all the terms used so that everyone may be in a position to use that which was created by someone else".

Discipline in formalization and organization is a further qualification need. It became evident in the initial phase that on average every user had filled some 50% of available storage space with data which he did not require. A number of staff had thousands of electronic documents in the in-coming and out-going "drawers" and had never cleared these since 1988. The system coordinator had to compel them to do so. Deleting all the documents was not an acceptable solution. The use of a communication system requires of each member of staff decisions on further use or archiving a document after it has been created or read.

6.3 Independent "hands-on" learning on the job

Independent "hands-on" learning is regarded as necessary and is practised to an increasing extent by staff members. Proper use of the system - it is maintained - is learned only by "working with it". The main requirement for this is an acceptance of the communication system. The first initial training course introduces the rudiments of word processing and electronic mail and aims to instil acceptance of the system.

The most important element of independent learning is simply working with the system. For example, staff members commenced by sending each other electronic mail as a preliminary to using this form of communication for their work. Staff members are required to consult the manual for all questions which they cannot solve themselves before turning to other colleagues or to the system coordinator. The system manuals are extremely comprehensive and there is a need to learn to use them properly. Proper use of the manuals is important as they are incorrect in various sections. The third form of independent "hands-on" learning is the exchange of information amongst staff members. This takes both a spontaneous and organized form. Experience has shown that independent learning facilitates acquiring many skills in using the system. The system coordinator himself has good reason to promote the process of independent learning as this puts him in a position to learn more about the system's efficiency and the problems presented by the system, an important basis for proposing solutions and for incorporation in the training courses.

The system's learning programme is seldom used as it requires reading too much text on the screen. For the same reason, the in-built help functions in the system, which again consist of texts, are seldom used. Users are more inclined to read a text in the user manual than on screen.

7. THE REACTION TO QUALIFICATION NEEDS

The firm reacted to the changes in qualification needs by creating a post for a system coordinator. It is his task to set up new workstations, to give initial one-day training courses and to advise, support and give the further training which is required.

The one-day initial training course aims to help users overcome their fear of the system and to instil acceptance. It aims to show "that even when mistakes are made nothing happens" - in other words - to show that the system can cope with mistakes made by the user and that these are unimportant in comparison to a collapse of the entire system. The course also gives an overview of the functions contained in the system and finally an explanation is given of how to create and send texts as some 90% of the users require these functions. In their first exercise the trainees produce a certificate on the system.

Basic training for the system is provided in a training room with eight workstations. Annually on average some 40-50 1-day courses are offered with 6 to 7 trainees participating in each 1-day course. The system coordinator is also available to answer queries and to help when problems arise and can be contacted either by telephone or electronic mail.

After some two to three months the user's progress is monitored in order to ascertain if he is in a position to use the system adequately for his work. Because of the independent "hands-on" learning, such monitoring is not always easy. In the training courses the system coordinator deliberately omits certain functions to ensure that after a certain time the trainee is forced to enquire about these. If he does not do so, it can be assumed that he is not making proper use of the system. At this point the system coordinator intervenes and usually this evokes questions on further functions offered by the system. The system coordinator then organizes further training courses tailored to the needs of individual users or user groups. These may take anything from a

quarter of an hour to three hours and are held in the training room. It is the initiative of the individual user which is imperative in these cases and there is no lack of such initiative.

8. STRUCTURAL CHANGES IN IN-COMPANY TRAINING

In-company training is undergoing restructuring at present. To date further training courses were given by external trainers. In future in-company trainers are to be used as this is less costly.

Fixing training needs is the task of management who on a yearly basis ascertain the training needs in various areas, for example, technology, data processing, management, methods, languages. These needs are then catered for in internal and external training courses. For the past two years courses have also been offered on health aspects, for example, autogenic training, gymnastics, posture, and courses on giving up smoking.

The organization of staff training is a management task. Management has talks with individual staff members on their occupational perspectives within the framework of the structure set up to this end within the enterprise. Staff members themselves may also take the initiative and may contact the staff advancement unit directly, provided his/her immediate superior is involved in any issue concerning training needs.

SECTION THREE

SYNTHESIS

1. INTRODUCTION

The main hypothesis behind the CEDEFOP project on the "Effects of qualification on the organization of work" assumed that new forms of work organization are gaining in importance and call for skills which can only be developed at the workplace or through the work force being directly confronted with their tasks.

The three case studies carried out in Germany basically confirm this underlying hypothesis: a larger number of decentralized learning processes are required as a result of technical and organizational changes in the technical and commercial field. In-company concepts of continuing training had to be completely overhauled. Instead of the two-phase development of the contents of centralized continuing training (1st phase: identification of training requirements for a reference period in the production and/or specialized departments; 2nd phase: incorporation of the results into both internal and external continuing training measures as the basis for a continuing training programme), a new situation was identified in all three case studies. Decentralized learning processes have gained ground. Furthermore, there has been a shift away from continuing training strategies which aim to overcome skill deficits determined on the basis of global analyses of requirements. The emphasis is now on a policy of in-company training which is pro-active, anticipates technical innovations, allows for medium-term developments in human resources and skills, and is thus oriented towards tapping skill potential.

The implementation of this new strategy for in-company training is far from complete, as the three case studies clearly show. It ranges from non-specific, increased awareness for what happens at the workplace to sophisticated methodological-didactical concepts for structured and model group work or to the development of a training infrastructure in the work environment.

This summary report will present several aspects of the various in-company responses to jointly identified developments and will peg out the problems requiring further discussion. This will be done in two ways:

Firstly, the context of the learning processes at work or related to the workplace will be elucidated in the three case studies. Then, an attempt will be made to analyze some of the parameters listed in the macro report which reflect the specific nature of the respective national situation.

2. LEARNING PROCESSES AT THE WORKPLACE

2.1 The workplace as the trigger for learning requirements

All three case studies clearly illustrate that centralized, supply-oriented incentive continuing training is no longer in demand. Although, there are still some continuing training schemes which are seen as rewards for deserving staff or form part of the in-company social system, the majority of continuing training schemes are either a reaction to the skill deficits identified decentrally or are preventive measures oriented towards tapping potential skills in preparation for concrete, technical and organizational changes and/or the use of new communication systems.

This has considerably altered the defined role of traditional, centralized training departments. Some in-company training activities have been shifted either completely or largely from the training department to the specialized and/or production department (as was the case in the

railway engineering division of Enterprise A) or the training department has taken on more of a mediatory or supporting role. In each case the individual employee and/or group has increased in importance as a source of concrete learning requirements. The measures introduced to meet these requirements have been increasingly structured in an individualized or group basis near the workplace.

2.2 Preliminary qualifications orientated towards potential as a prerequisite for learning processes at the workplace

A further change in in-company training was already mentioned under 2.1 but will now be examined in greater detail. Even if in the past companies wanted to plan continuing training against a backdrop of differentiated investigations of requirements at the workplace, they were increasingly confronted with problems over the last few years. Although the requirements were accurately determined and incorporated by the central training department into a concrete model for continuing training, the mediation procedure revealed that the basic conditions at the workplace had changed so much in the meantime that the skill generating schemes were only partly successful. The reason for this were the accelerating restructuring processes due to technical or product-related alterations.

Even in **Enterprise A**, where structural measures for learning on the job were still unimportant, the problems described above led to increased technical development (e.g. the installation of new systems), staff development and the development of the employees' responsibilities and skills all being regarded as a unit in the medium term. Not **after**, but as early as possible **before** a technical change it should be clear who is to work on the new systems. Motivation is encouraged and forward-looking training schemes provided. Once the new machines or complex systems have been set up, only supplementary measures, building on the preliminary qualifications, take place at the workplace.

2.3 Learning processes at work

The case study of **Enterprise A** and the groups in the division "railway engineering" presented us with learning processes on the border between intentionally structured learning processes at work and conscious use of learning effects from work. A closer look at the components of group work which concretely trigger learning processes, the challenges in terms of independent work, a sense of responsibility, customer care, reveals that the learning potential at the workplace is being used here. It is this potential which is an essential feature of the "dual system" of training for young people: a mixture of very heterogeneous challenges for the group leader or master to explain the basic theory or work organization principles and to relieve the strain when trainees are overtaxed as well as the increased pressure to become a full member of the team.

The question remains whether learning processes such as these are new and are the result of changing technical and organizational requirements, or whether learning at the workplace is experiencing a revival for economic reasons (reducing the costs of in-company training) or for reasons of efficiency (increased importance of cost/benefit analyses).

2.4 Group work as the starting point for the structuring of learning processes at the workplace

In the case of **Enterprise H**, group work was not primarily designed to create a new type of skill in the enterprise. The enterprise was mainly concerned with increasing productivity and the job satisfaction of staff by reorganizing work. Since the possibilities for further technical rationalization by means of innovation were more or less exhausted, group work seemed to be the last resort for survival in the global competition between the large automobile companies.

Group work and the related adjustment processes in fact involved the introduction of new "control factors" which relied on the responsibility of the staff.

This kind of organizational development produced different effects in the qualification process:

Firstly, all the activities for preparing and implementing group work in the case of **Enterprise H** were accompanied by measures for qualification and the promotion thereof; they occured at all levels within the enterprise. This could really be called a "learning system": group work was imposed "from above", i.e., it presupposed a new approach to organizational forms by senior management. In a so-called integration programme, all staff members were informed of the future technical changes and changes to the organization of work.

Group work was introduced on the basis of a one-year, 7-phase model. In addition to organizational and informative elements, it also included numerous formal and informal training activities. For example, senior staff were trained for new management tasks in workshops, and other members of staff underwent interdisciplinary training to prepare them for future integrated tasks. The group work itself was not so much concerned with explicit learning goals and effects but rather with the learning content and possibilities at the workplace and in the work environment. In the final analysis, it all depended on what the group members made of these opportunities.

In the case of **Enterprise H** the learning conditions were characterized by the following work elements and structures:

- A team of ten to twelve staff members with varying skills (skilled workers as well as unskilled and semi-skilled workers) worked together in one manufacturing cell (the shell).
- The jobs were upgraded and extended and particularly important aspects of maintenance and quality control were integrated into the manufacturing process. Thus, there were varied working environments.
- There was no formal hierarchy within the group: the elected spokesperson for the group was the contact person and facilitator, not its superior.
- The members of the group carried out different tasks (e.g., plant controller, plant electrician, supplier, quality controller, machine operator) in which they could stand in for each other. This enabled them to plan, carry out and control the group tasks more or less independently.

The work was structured in such a way that there was scope not only for action and decisions but also for improved communication. This, in turn, facilitated and encouraged learning effects.

Viewed in isolation, it is difficult to identify and put an empirical label on these learning processes, particularly as they need not necessarily arise for all group members. Group work (job satisfaction and productivity) will, however, only be successful if the learning processes advance on two levels:

- Firstly, the group was to acquire expert skills through access to different workplaces. Cooperation with other colleagues who have different formal qualifications, too opened the door to mutual learning. This not only occurred in the form of learning-by-doing: in **Enterprise H** when a disruption occurred, for example, it was highly probable that the plant electrician in the group would convey theoretical knowledge to his colleagues.

This basically meant that each member of the group could acquire and develop expert knowledge for all the tasks likely to occur in his work environment.

◊ Secondly, work was structured on the basis of inter-disciplinary and/or social learning goals. Dismantling the hierarchy, i.e., replacing "external" controls with "inner" ones undertaken by staff members is based on a monitoring system which is characterized by a sense of responsibility, relational thinking and doing as well as communication and cooperation skills. To a large extent, the group work becomes a mutual education process in which social skills are acquired, practised and applied.

The actual learning effects depend mainly on the group and its members. Thus it is not clear whether a specialist, for example, is prepared to pass on all his expert knowledge to his colleagues.

Enterprise H consciously relied on the learning effects of group work described above. So far, hardly any action has been taken to establish and verify the results of the group as learning processes for all those concerned. In this respect, group work has not yet developed into a process by means of which specific skills can be acquired and then validated in one way or another.

2.5 New methodological concepts for shaping learning on the job

The introduction of an office communications system throughout the whole company, as planned by **Enterprise K**, requires new methodological concepts for training its users. The main reason is the discipline demanded by the system of its users. All tasks have to be named, information needs to be concisely transcribed, decisions have to be taken constantly on work and deadline planning, transmission, storage and deletion. Filing and indexing have to be dealt with in a standardized manner by all concerned. The discipline demands constant learning if the system is to be used efficiently. These skills cannot be acquired in in-company or external seminars. The function and contents of seminars had, therefore, to change.

In **Enterprise K** a new concept for continuing training was developed to accommodate these changes. The concept was based essentially on providing resources for individual and cooperative self-qualification. The first step was a centrally organized one-day basic course. The users were given a brief overview of the system and practice the basic functions required for initial use of the system. These were basic prerequisites for the subsequent individual self-qualification. For this, the users were given manuals, help texts and teaching software at the workplace. If the users did not reach the targeted result by way of individual learning, this was followed by cooperative self-qualification. The users were instructed to only ask colleagues for assistance and advice once their own efforts had proven unsuccessful. It was only when this too failed, that the system coordinator offered individual counselling. Furthermore, if there was a more complex need for continuing training for several users, a centrally organized special training scheme was carried out by the system coordinator or an external trainer. This concept for continuing training made completely new demands of staff since, firstly, individual and cooperative self-qualification did not conform to the traditional idea of continuing training and, secondly, the integration of learning on the job was far from being widespread and generally accepted. Two difficulties needed to be overcome: altering the learning philosophy and the working philosophy. The difficulties in carrying out the necessary alterations could be seen in **Enterprise K**, for example. The resources available for individual self-qualification were used inadequately, cooperative self-qualification only existed in rare and spontaneous activities and forms. At the beginning of this process, the system coordinator had to enforce the utilization of the learning potential inherent in working with the system by way of frequent checks, sometimes for several years.

3. BASIC CONDITIONS AND FACTORS INFLUENCING LEARNING AT THE WORKPLACE

3.1 Networking vs. the stand-alone solution

The company-wide introduction of an office communications system aims to transfer all the administration tasks within the company, most of which are communication tasks, on to an electronic medium. The aims are to rationalize operations and to achieve a higher throughput rate. This type of office communications system requires a central coordination unit responsible for managing the system and providing user support.

It is likely that the necessary training for users will be centrally organized. However, this need not necessarily be the case as the case study of **Enterprise K** demonstrates. A centralized training process is hindered by the complexity of the available system functions, the lack of transparency in their operation and effects, the indirect control via the keyboard and the many different ways they can be used depending on the task in hand. The use of the system not only produces individual requirements; these individual requirements also occur at completely different times. Extensive training prior to using an office communications system brings with it the risk that participants may forget the system functions they do not need and would thus be inefficient.

In **Enterprise K**, these considerations led to a graduated concept for training activities. This begins with central basic instruction, in which an overview of the whole system is given, as well as an introduction to the use of the system. The media available for the subsequent longer phases of individual and cooperative self-qualification are then presented. Only then are seminars on specific software applications organized centrally as required.

The networking of the tasks does not mean that responsibility for the qualification process is still centralized. It is rather the case that important elements are transferred to the workplace. However, the basic conditions for these are provided and coordinated centrally.

3.2 Participation vs. determining positions

The formal influence of staff committees on the organization and structuring of in-company training is relatively small given the statutory situation (cf. macro report, section 4.7). Added to this is the fact that the interest of staff committees in continuing training as an area for in-company debate is often underdeveloped. This was partly confirmed in the case studies.

When adapting learning opportunities to changes in work organization, interest focuses on influencing internal work structures.. Thus group work, for example, was introduced in **Enterprise H** on the basis of an in-company framework agreement. Here, however, the learning opportunities integrated into work did not play an explicit role.

The skills required in connection with the introduction of new production concepts are not usually a cause for conflict. New production concepts which redefine the relationship between the use of technology, organization of work and qualification are only successful if they are actively supported by a large majority of the staff. The formal representation of interests risks losing importance here.

Within the framework of group work in **Enterprise H**, new interactive structures were formed which also affected the structuring of learning on the job (cf. 2.4). On the one hand, the hierarchical structures become flatter. In the case of **Enterprise H** the hierarchical position of the deputy foreman was dismantled. On the other hand, the groups were given a series of tasks which they could accomplish on their own responsibility, e.g., holiday plans and the daily distribution of work. The group spokesperson, who is not a superior, was elected by the group. The possibilities for structuring and seizing the learning opportunities at work also fell within the realms of group responsibility. However, there were no grounds as yet to believe that these new opportunities for participating in the structuring of learning processes at the workplace were consciously being used by the staff representatives to bring about recognition of achievements in continuing training, for example.

3.3 The role of in-company initial training

Reference was already made in the macro report to the importance of preliminary qualifications for young people in the dual system in respect of the content and structuring of in-company training. Training activities at the workplace touch on the experiences of those who have completed in-company training and are thus likely to be very effective.

Apart from the general importance of the dual qualification of skilled workers, the case study in **Enterprise A** provided specific results. The different qualification concepts of the two branches in case study **Enterprise A** illustrated that a qualification as a skilled worker is a viable basis for completely different approaches to in-company training, even if this qualification results from a concept of graduated training which German vocational training policy has since abandoned. Starting with workplace requirements, the technical and organizational alterations revealed two deficits: theoretical deficits in the electronics division, and the requirements in respect of interdisciplinary skills. The two-year initial training phase of the electrical appliances technician allowed the in-company training scheme to encompass both evening classes in the power electronics division, in which the higher theoretical requirements prevented the company from using the staff on a broad scale, and also more complex, responsible skilled work teams in which primarily customer-oriented repair and maintenance jobs had to be performed. In-company initial training had laid the foundations for the ability and motivation to learn as well as for the application of the skills acquired during training in work groups entrusted with complex tasks.

3.4 The importance of in-company certification of training measures or certification extending beyond the company

The certification of learning processes at work is hardly of importance in Germany. Only within the company can the continuing training measures lead to a more demanding and possibly better-paid position on completion of training.

In **Enterprise A** certification extending beyond the enterprise played an important role as an incentive for staff. It was also the attraction of the certificate which allowed the continuing training measures to take place during the staff's leisure time and thus reduce costs.

Within the enterprise, staff were promoted to higher levels following completion of the recognized course in power electronics and qualifying participation in the work group on railway engineering. However, this promotion was not necessarily the result of continuing training measures but was often successful performance in new (extended) jobs. In both parts of the enterprise it was expressly pointed out that the assignment of new tasks would not have been possible without the previous continuing training measures.

From the viewpoint of internal staff planning, the different qualification strategies also had different consequences:

Power electronics

During the continuing training course the staff remained at their old workplaces. There was little or no possibility of linking the course contents to concrete work experience. The "market value" of those who had completed the training measures rose on the external job market. On completion of the training programme, the enterprise had staff capable of coping with very extensive technical and organizational changes in a very flexible manner. Further learning processes at the workplace were, however, necessary as the training measures had concentrated on theoretical knowledge.

Railway engineering

The qualification process in work groups was informal and no certification was planned. The results of the learning processes at work could be used directly by the enterprise. Employees were motivated by the realistic, albeit not legally enforceable, prospect of more demanding and better-paid jobs. These employees could not be used as widely as those who attended the course in power electronics since the increase in the ability to act through learning on the job resulted in more heterogeneous learning results than was the case with formalized courses.

Certification was also important in the other case studies. Thus in **Enterprise H** reference was made to the fact that not every continuing training achievement could be rewarded by higher pay or promotion. Continuing training was primarily regarded as an effort to secure one's job. However, due to the numerous continuing training measures within the enterprise, a qualification pass has been introduced in which the staff can record proof of their training activities. This proof of qualification does not bring with it any rights within the enterprise. Until now the organized training measures have been recorded. However, work experience and effects of on-the-job learning are not verifiable in this manner.

3.5 Corporate philosophy and learning at the workplace

Continuing training is an instrument and, at the same time, an expression of the philosophy of an enterprise. This was confirmed by the case of **Enterprise H**. Without actually using the term corporate philosophy, some of the training activities were intended, for example, to create and/or support the conditions for successful group work and other projects to do with organizational development.

At the same time, the learning opportunities and processes were integrated into the work environment and were part of the corporate philosophy. Learning on the job, as well as formal continuing training, were part of the continual process of improvement for **Enterprise H.** Each individual should identify himself completely with the company and the work group and thus be interested in constantly improving the quality of work. Learning on the job is completely integrated into this entrepreneurial concept.

4. SUMMARY

The following theories describe trends in in-company training strategies and in skill generating developments in organization. The theories are not just based on the evaluation of the case studies but also on many years of observing developments in qualifications, organization and continuing training as well as on current expert opinions. Thus reference is not always made to our case studies.

4.1 Technology, organization and skill generation

Skill generation as a potential for structuring

Due to the linking of work by way of computerization, technology and organization are increasingly becoming independent sources within modern rationalization concepts. They have specific effects on the development of skills (e.g. DP for skilled workers) and they transform the skill itself into an independent source of structuring (e.g., to guarantee the quality of the product at the production site).

Process innovations require skills related to the workplace

Process innovations in information and communications technology lead to the formalization and programming of the work processes at company level as well as on the level of the individual working methods. The availability of software at the workplace means that innovations also demand continuing advances in task-related software applications, e.g., adapting standard software.

If the processes of formalization, process development and programming are to be accomplished efficiently, this is best done with the direct participation and cooperation of the staff. As the case study in Enterprise K shows in exemplary fashion, this cooperation needs to be organized in good time by an internal coordination and services department, which has no hierarchical function. Nonetheless, this unit will gradually assume more and more decision-making responsibilities on expert matters.

The participation and cooperation of staff requires not only the organization of task-related continuing training processes at work, but also support for the individual and cooperative self-qualification of staff in an independent manner. All the case studies show that any realistic determination of training needs requires the direct cooperation of the staff.

Group work promotes task-related skills

Group work is developing into a new form of work organization in high-tech and automated processes. This is likely to lead to increased work productivity due to a higher degree of job satisfaction, social learning and the flexible allocation of tasks within a work group.

A higher degree of job satisfaction, social learning and a flexible assumption of tasks, i.e., responsibility for the performance of the work group, do, however, require timely organization at company level as well as new types of self-organization of the group's tasks by staff. This self-organization has to be structured in a functional manner since hierarchical structuring could unleash counterproductive group dynamics.

Group work requires a preliminary qualification to encourage responsible social learning within the group. On the other hand, the workplaces themselves have to be structured so as to promote the learning process and the workers within the group need to have access to a decentralized unit to assist in the autonomous qualification processes.

Responsibility of the company and the individual for skill generation

Both the technical and the organizational rationalization concepts indicate that the development of staff potential for qualification is increasingly becoming a decisive factor in innovation processes. Individual and cooperative self-qualification will increasingly become new forms of continuing training in both rationalization concepts as well as in the development of qualification

potential. The case studies reveal that part of the responsibility for qualification will increasingly fall upon the staff themselves; management will be responsible for ensuring that self-qualification is possible.

4.2 In-company continuing training

The following trends can be observed in large companies:

Broadening the spectrum of continuing training opportunities

The development of organization is broadening the spectrum of possibilities and types of in-company training. This extends from traditional instruction to learning processes integrated into the work situation. Various types of continuing training have developed between these two extremes, e.g.:

- ◊ group work, training workplaces (related to organization)
- ◊ induction, coaching (oriented towards the individual)
- ◊ quality circles, workshops (group-oriented)
- ◊ CBT, distance education, self-teaching material (media supported).

The new forms at the workplace and the leaning processes integrated into the work environment have not all been quantified by the enterprises. In many cases this is difficult as the dividing line between learning and actual work is fluid.

Internal continuing training schemes

The growing requirements for continuing training are so specific to each company and plant that they can only be met by means of internal, "tailor-made" programmes and seminars. Even when the manufacturers of plants provide the instruction, this can only be related to the conditions specific to the company with the help of internal measures carried out on site.

Outsourcing of continuing training programmes/services

Large companies are increasingly outsourcing their training departments and setting them up as legally independent profit centres. These centres offer their services on the training market; the hived-off centre is then just one supplier among others.

Decentralization of continuing training

Both internal continuing training and the outsourcing of continuing training have repercussions on organization within the company: the activities of the training staff increasingly shift to the organizational units, to the production area. Continuing training is decentralized.

Integrated continuing training network

The decentralization as well as the outsourcing of continuing training are inter-correlated trends. Internal types of continuing training cannot replace external continuing training provision, just as external continuing training is no substitute for the new learning possibilities at the workplace. This is the prerequisite for cooperation and networking between companies and external suppliers. This integration and cooperation may extend to various continuing training activities, such as developing programmes, counselling the company or staging seminars. The differentiated structuring and development of cooperation between companies and external

suppliers of training (right up to technical universities) can be the foundations for an independent, in-service vocational training system.

Acceptance by and responsibility of the training staff

The trends described above also lead to a change in the role of the training staff. In-company trainers are not only teachers during the courses; they are also directly involved in the problems of qualification on site. They are promoters of organizational development and facilitators of learning processes within the organizational units. Their importance as on-site problem-solvers is increasing as is their acceptance within the company. At the same time training staff are becoming increasingly involved in the decision-making processes and assuming more responsibility within the company. The growing acceptance of training staff may also mean that in-company training is losing part of its "critical distance" to the running of the company.

Financial pressure

The need to generate skills leads to increasing financial pressure within the company. The trends outlined above are partly a direct consequence of this cost squeeze. The outsourcing of training departments as profit centres, for example, cuts down on expensive over capacity. Decentralization also means that continuing training is becoming more dependent on economic factors, as it is directly linked to the functional areas within the company. Since learning is integrated into work, the actual learning costs (e.g. group work or other work organizational measures) can no longer be reduced in isolation.

This financial pressure also affects the relationship between initial and continuing training. In many cases it is more cost effective to provide continuing rather than initial training for unskilled and semi-skilled workers. The costs for continuing training partly replace the costs of initial training.

4.3 Relationship between in-company training and initial vocational training

Vocational training as the basis for in-company training

Vocational training is an excellent foundation for efficient learning processes at work and/or integrated into the work environment:

- ◊ It offers adequate theoretical presentation of the basic knowledge required for the pursuit of an occupation.
- ◊ Learning in the form of vocational training includes socialization within the company, a methodological approach which is also typical of learning processes at work.
- ◊ As opposed to skilled blue-collar or white-collar workers trained in school, those who have completed in-company training are aware of the need to learn by doing. They are prepared to continue learning on completion of training.

In-company training as a substitute for initial vocational training

In various companies there was a noticeable tendency to substitute qualification measures at work and/or on-the-job learning processes for the systematic initial training of young people. Trends of this kind may emerge

- ◊ If initial training (lasting 3-3½ years) leads to over-qualification for a growing number of jobs, something which is not exploitable by the company.
- ◊ If the costs of initial training are so high that in-company training of the regular work force, plus attracting skilled workers away from other companies or reorganizing work, are sufficient for adapting to technical and organizational changes.
- ◊ If the company seems to be unable to meet the demands of those completing training in respect of remuneration or basic working conditions.
- ◊ If the demand for vocational training in particular occupations drops to such a level that the recruitment standard of young people prevents training contents from being passed on.

Possible future links between vocational training and in-company training

The future demographic development as well as the trend towards qualifications at a level higher than that of skilled worker will raise the status of in-company training. At present it remains to be seen:

- ◊ whether learning processes at the workplace will supersede more systematic learning by young people in such a way that there will be a shift of responsibility to the individual companies within the framework of desystematization efforts, or
- ◊ whether in the field of continuing training too, there will be a move towards systematic recourse to external trainers, with the result that cooperation between internal and external training measures would be possible for all levels of qualification.

There are many indications that initial and continuing training will become more interrelated and interconnected. There are also prospects for the acquisition of officially recognized qualifications within the framework of qualification systems in which in-company training is also involved.

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